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"We're going to see who blinks first."

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DEC

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ARCHIVE

Lawmakers in Massachusetts, whose economic 'miracle' is stumbling of late, are mulling tough, antihostile-takeover measures. (The state is also the headquarters of Prime, the computer industry's only hostile-takeover candidate.) While not making companies takeover-proof, Gov. Michael Dukakis' proposal would mandate broad protections for workers threatened with firings that result from a corporate raid. The problem is that many of the major takeover targets in Massachusetts, such as Prime, are registered in Delaware for tax purposes and would be immune from the measures. It's the thought that counts.



Printer purchasers only have eyes for what's practical. Page 51.

Tracking the Valdes oil spill may be the ultimate IS management challenge. Page 45.



EXECUTIVE BRIEFING

■ **Competitors react to Officevision.** Data General, Hewlett-Packard, Wang and DEC say they'll outdo IBM with office systems that offer similar functions but connect to a wider variety of hosts and PCs. Unix and client-server architectures are common in each method. **Page 1.** IBM says you need its proprietary OS/2 Extended Edition or PC-DOS to connect to Officevision. Oddly, OS/2 Standard Edition won't work, except in DOS mode. Observers see it as a move to exclude non-IBM PCs. **Page 8.**

■ **The so-called plant-closing law** can affect IS staffers, not just blue-collar workers. The U.S. Department of Labor advises that the law — already the subject of a court case — requires advance notice for layoffs of 50 or more employees. The issue is raising security concerns in the IS community. **Page 1.**

■ **The service bureau** may not be dead yet, as indicated by some companies' moves to outsource for their CPU cycles. Frequently, those companies are driven to service-bureau-type vendors by the need to cut IS costs incurred during takeover battles. **Page 1.**

■ **The combination of Sybase's SQL Server and Unix workstations** seems to fit the plans of Salomon Brothers. The New York financial services firm sees a workstation/server strategy as a possible means to slow the growth of and reliance on IBM mainframe-oriented database management. **Page 37.**

■ **Organizations need to consider the perspective of Cobol programmers** who are learning a fourth-generation language. The programmers should be encouraged to shed their 3GL outlook, learn database design, emphasize documentation and code efficiency in 4GLs. **Page 89.**

■ **A better monetarist?** Printer vendors are working hard to come up with innovative products and enhanced functions, but cautious users, are taking their time in making a commitment. New technologies — particularly in the nonimpact field — are appearing, but their introduction into the mainstream is more of a slow gathering of acceptance than an energetic burst of popularity. **Page 51.**

■ **Bankruptcies, takeovers and natural disasters** can happen to any software vendor and have inspired user companies to seek escrow agreements on their key software programs. Some of those IS shops now have enough experience to talk about the concerns and procedures to be addressed in such a contract. **Page 23.**

■ **Antrak plans to replace thousands of terminals and other equipment** used for reservations and ticketing with more than 10,000 PCs as part of an 18-month, \$20 million project. **Page 7.**

out from underneath him, will head a staff of about 200 IS professionals. **Page 4.**

■ **A new breed of interactive computers** is on its way. Despite early recognition of the need for humans to interact with their computer tools during problem solving, technical barriers have prevented this vision from materializing. But recent advances in computer graphics and supercomputing technology have challenged those barriers. A new class of interactive supercomputers holds promise similar to that of such problem-solving tools as the scanning electron microscope or the telescope at their inception. **Page 63.**

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He gathers no moss

Koeller bounces from TRW into Whirlpool post

BY CLYTON WILDER
COWLEY

BENTON HARBOR, Mich. — Former TRW, Inc. Vice President of Information Services Richard D. Koeller, an avid gardener, did not let much grass grow under his feet.

Koeller will take over the top IS post at Whirlpool Corp. Thursday as vice-president of information technology, a newly created position and the company's first IS job at the vice-president level. He reports to James M. Sammartino, executive vice-president and chief financial officer of the home appliance manufacturer.

Koeller, 51, will head an IS staff of about 200 at Whirlpool. He left TRW in March after the Cleveland-based conglomerate consolidated its corporate IS function and eliminated Koeller's position (CW, March 20).

Koeller says his responsibilities at TRW beginning to shrink during the past year as his corporate IS staff was reduced to 85 people at the start of 1989 from a peak of 220. He became disillusioned with the diversified nature of TRW, in which the acquisition/divestiture strategy resulted in the diffusion of IS responsibilities, he said. In his corporate components group in which Koeller began his TRW career, all six operating divisions

were sold in the past two years. "My responsibilities will be significantly increased because Whirlpool is much more focused on one industry, unlike a conglomerate," Koeller said last week. "They're out to be the



Koeller tends to his garden and to Whirlpool's systems needs

No. 1 appliance builder in the world, and their chairman, David Whitman, has a very strong feeling about the need to have strong IS activity."

Koeller joined TRW in 1981 as IS director of the aircraft components group and became vice-president of corporate IS in 1985. The Springfield, Ill., native previously held transaction systems at International Harvester (now Navistar International Corp.) and began his IS career at Inland Steel Industries, both in Chicago.

Back morns

FROM PAGE 1

keep the data center alive," said Bill Morgan, vice-president of IS at Copperweld Corp. in Pittsburgh.

Strapped for cash four years ago during the steel industry downturn, Copperweld closed its data center and moved its National Advanced Systems 80/53 to Genix Enterprises, Inc., a Pittsburgh-based outsourcing provider whose bookings increased 54% in fiscal 1989.

"At first, there was some growing from the people who wanted to be near the computer," Morgan said, "but I don't think any of them want to go back now." Morgan said that outsourcing played a big part in allowing Copperweld to slash its systems budget in half, to \$4 million per year.

San Diego-based Foodmaker, Inc., a billion-dollar restaurant chain operator, just signed a three-year extension of its processing-services contract with Litton Computer Services. Terry Babbitt, vice-president of IS, estimated that he saves about \$180,000 in salaries alone by going outside. "We consider Litton the computer experts, while we're the restaurant application experts," he said.

Many IS executives say they feel that mainframe processing cycles have become commodities, reducing the need to own those resources. "In a sense, it doesn't matter where you draw the line — whether you buy those resources from IBM or from a company providing access to them," said David Karney, vice-president of IS at Zale Corp. in Dallas.

Merger-mania, has helped

spur the outsourcing trend because of the emphasis on IS cost-cutting and the divestitures of business units formerly tied to their corporate parent's data center (see chart page 1). Sterling Chemicals and Purina Mills, for example, both chose McDonnell Douglas Information Systems Corp. instead of operating their own data centers after being sold by Monsanto Co. and Ralston Purina Co., respectively.

Tony Sugden, director of IS at Rhone-Poulenc, Inc., in Princeton, N.J., said outsourcing to a Genix mainframe allowed his firm to choose the application it wanted — McCormick & Dodge Corp.'s Fixed Assets. "We took advantage of that package across our businesses without having to invest in our own MVS machine," Sugden said.

Some say the arguments in favor of outsourcing would hold less water in larger IS organizations. The economies of scale in large firms should hold transaction costs below what a services vendor, with a built-in profit margin, could offer.

Outsourcing is not without its risks, said George Hathaway, a principal at the Index Group, a Cambridge, Mass.-based IS consultancy. "When you're in a multiple-user environment, your data shares devices with other companies' data, and there's a greater risk of inadvertent destruction of data."

Nonetheless, some billion-dollar firms such as American Standard, Allegheny Ludlum Corp. and Foodmaker have made the outsourcing move, and more are reportedly considering it. "Once you can get over the 'I own the hardware' idea, it really makes sense," said Gary Biddle, American Standard's corporate vice-president of IS.

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Oracle 6.0 not breaking speedy release records

BY DOUGLAS BARNEY
COWLEY

BELMONT, Calif. — Oracle retooled the Concorde to announce its Oracle Version 6.0 transaction processing system last July, but the pace of deliveries has been something short of supersonic.

Oracle Version 6.0 represents Oracle Corp.'s boldest stab yet at providing high-performance database management. Its Transaction Processing Option (TPO), formerly called Transaction Processing Subsystem (TPS), is supposed to give the database management system performance comparable to the fastest products on the market. However, shipment delays and user worries about cost and migration have slowed the pace

of the much-anticipated rewrite.

At last year's announcement, company Chairman Lawrence Ellison said that by the end of 1988, "all our systems will be TTS systems."

However, critical pieces of Version 6.0 remain in Oracle laboratories. The PC Server version, which Oracle head of personal computer products Gene Shklar promised would be out early this year, is still unshipped. As Oracle spokesman said recently it would ship "this year."

The IBM MVS version, originally set to ship last year, will go into beta testing next month, Oracle said. An IBM VM version is also still in beta testing.

The Vaxcluster release of Version 6.0 is slated for delivery this summer. "We're still on target to ship this at that time," Or-

acle Vice-President Peter Tierney said.

Tierney defended the pace of Version 6.0 shipments. He said that planarians now supported by Version 6.0 include VMS on VAX, Sun Microsystems, Inc. and Sequent.

He added that versions for Pyramid Technology Corp. and Data General Corp. machines will ship shortly and that Oracle will be "rolling out" Version 6.0 support on the other major platforms in coming weeks and months. A spokesman said Oracle has sold 420 Version 6.0 licenses.

Of great import

Tierney called the Version 6.0 project both massive and important. "There are 255,000 lines of new code in Version 6.0 [compared with Version 5.0]. It took us 2 1/2 years. Not only did we rewrite the product; we changed the philosophy," he said.

But based on interviews with key Oracle users last week, there is no rush to ship DBMS

users to the painstakingly created Version 6.0.

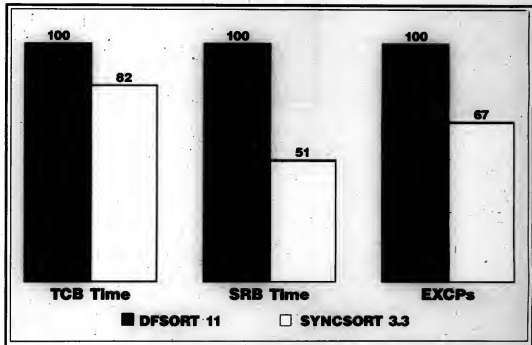
Customers are hearing that conversion to Version 6.0 is more difficult than conversion to previous versions because of the TPO component. "I've been to a class on migration. It doesn't look like it will be fun," said Dave Rosebach, a systems analyst and product administrator for Oracle at US West. Rosebach is writing for the VM release of Version 6.0 to ship later this year to begin implementation.

Some customers are also irked by Oracle's plan to charge a hefty premium for the upgrade to Version 6.0 with transaction processing. Oracle said it will soon unbundle transaction processing to give users a choice.

"There should not have been a charge," said Jack Wilkerson, project engineer of manufacturing systems at John Deere & Co., who added that "we need Version 6.0 capabilities."

West Coast Bureau Chief Jean S. Buehner contributed to this report.

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Bullish on Brooklyn?

Merrill Lynch & Co. may move its main data center out of Manhattan and into either Jersey City, N.J., or Brooklyn, N.Y., according to DuWayne J. Peterson Jr., executive vice-president of operations, systems and telecommunications. In a speech last week, Peterson said the move will cut expenses in half and allow the securities firm to build an advanced computer center.

Fujitsu source-code facility opens

A secured facility was established in Tokyo last week as a result of last November's arbitral settlement of the IBM/Fujitsu Ltd. source-code wars. Within its walls, certain Fujitsu employees not involved in software development will be allowed to examine and extract interface information from licensed manuals and source code as set forth in the arbitration agreement. One safeguard: Systems security expert and newly named facility administrator Etsuo Ito, according to the arbitrators' announcement, has been instructed "to make no additional statements now or in the future."

Micropro dons Wordstar moniker

Micropro International Corp., maker of the venerable Wordstar word processor, has changed its name to Wordstar International. The company, which earlier this month began shipping Wordstar 5.5, resumed itself in part to "eliminate the confusion we have always faced because Micropro is a relatively unknown name, whereas Wordstar is a household word throughout the world," said Gari Grimm, the firm's president and chief executive officer.

First turnkey LU6.2 application

Spectrum Concepts, Inc. in New York is expected this week to announce what it calls the first turnkey LU6.2 application for IBM's OS/2 Extended Edition. XCom 3.0 for OS/2 is said to allow users to exchange files, jobs and reports with a wide range of computing environments supported by Spectrum's Xcom family, including Digital Equipment Corp. VAXs and IBM mainframes, System/36 and 38 and the Application System/400. Priced at \$950, the product is scheduled to ship in July.

Black boxes put out to pasture

Last week was the deadline for U.S. airlines to replace their old-fashioned flight data recorders — the on-board "black boxes" that provide data for airline crash investigations — with digital models that store data on magnetic tape for computer processing. The old versions, which log flight data by tracing lines with a mechanical stylus on foil tape, are less precise, easily damaged and require a special retrieval machine, the Federal Aviation Administration said.

Reservations merger challenged

Secretary of Transportation Samuel Skinner last week suggested challenging the proposed merger of the American Airlines and Delta Air Lines' computerized reservation systems. In a letter to U.S. Attorney General Richard Thornburgh, Skinner said the structure of the proposed merger "poses a substantial likelihood of producing an adverse effect on airline competition." He said the proposed merger should be modified to include an additional airline owner and to ensure separate management and marketing of the reservation systems. A Delta spokeswoman said she did not believe Skinner's letter would further delay the merger, adding that the concerns he raised were addressed in the original system-merger proposal.

Unix V 4.0 meets X/Open standard

AT&T's Unix Software Operation confirmed last week that Unix System V, Release 4.0 — due for general availability this fall — will conform to the most current X/Open Portability Guide. The firm also said that 23 members of Unix International have received early tapes of the upcoming operating system.

Xerox seeks licenses for interface

BY J. A. SAVAGE
CW STAFF

In a move destined to muddy the waters of software copyrights even more, Xerox Corp. said last week it would seek license fees for its pioneering work on graphical user interfaces, which was carried out a decade ago at its Palo Alto Research Center.

The announcement from X-

cording to Xerox. "We still believe we could continue to do what we were doing without infringing, but we've had to spend a lot of time and effort over the years to avoid the picket fence," said David E. Liddle, chairman of Metaphor. Liddle worked for Xerox during the development of the interface technology.

Xerox's move to seek licenses, which had been expected

and Ashton-Tate Corp. have used smaller companies, alleging infringement on so-called look-and-feel copyrights.

There was no consensus from legal analysts and industry observers as to what Xerox's license offer will mean. Even Apple acknowledges that its graphical interface development drew in part on work done by Xerox, although Apple maintains that its own work was well-protected by Apple copyrights.

Xerox "will have difficulty enforcing its policy demanding licensing fees because they waited too long to do so, and the law isn't clear anyway," said attorney G. Gervase Davis III, a specialist in intellectual property. "Yet if other companies have a Xerox license, it will make it difficult for Apple to sue them."

Two issues — money and the threat of litigation — will be the determining factor for other companies that already have some sort of graphical interface to Xerox.

"What's cheaper, to pay Xerox or to fight it?" asked Dick Shaffer, editor of the "Technologic Computer Letter." Shaffer predicted legal ownership will have little to do with a company's decision to license from Xerox. Instead, he believes companies will evaluate it on the bottom line.

Xerox, meanwhile, has hinted that it will act vigorously to protect its copyrights and patents.

Wend Coste, a correspondent for *Woury*, contributed to this report.



Metaphor's interface at the heart of the licensing dispute

rox coincided with settlement of a suit with Metaphor Computer Systems, Inc. Metaphor licensed Xerox technology to avoid further litigation. Specifics of the agreement were not available.

"It's not outlandish; it's reasonable," said a Xerox spokesman about the cost of the license, which covers icons, window and menu design, keyboard action and scroll bars, ac-

[CW, April 10], comes at a time when the personal computer industry is littered with suits and counter-suits over the issue of ownership of graphical interfaces. Last year, Apple Computer, Inc. sued both Microsoft Corp. and Hewlett-Packard Co., alleging illegal copying of Apple's user interface. Microsoft then countersued Apple, and both Lotus Development Corp.

MSA finds loyalty has value as IBM buys in

BY STANLEY GIBSON
CW STAFF

ATLANTA — IBM last week rewarded a committed Systems Application Architecture developer and paid \$10.1 million for a 5% stake in Management Science America, Inc. (MSA).

"We're ecstatic about it. In our turnaround situation, this gives us great credibility," MSA founder and Chairman John Imley said. MSA had been plagued by losses in the past year.

"The symbolic significance is more important than the cash," noted Imley, who said MSA had \$43 million in cash prior to IBM's purchase. Observers agreed that the investment restored prestige to the firm, whose financial situation had already begun to improve.

"This assures that MSA can carry out an extensive product redevelopment effort, gives MSA a very significant stamp of

approval and rewards them for being a loyal IBM supporter," said Kenneth Burke, vice-president at Allen Brown & Sons, Inc. Others saw the move as ensuring against a possible takeover of MSA. IBM does not "want MSA to fall into unfriendly hands that

might change MSA's direction," said Thomas O'Brien, director of research at Broadview Associates in Fort Lee, N.J. Imley, however, denied there was any takeover protection involved, claiming that much of MSA was already in the hands of a few individuals and organizations and that Georgia state laws guard against takeovers.

MSA was the target of a buyout bid by Computer Associates International, Inc. last year.

In a spending kind of mood

The MSA investment is only one of several equity stakes IBM has taken in smaller companies during the last year. Others include the following:

- Interact Corp. (March 1989), a maker of software tools and compilers.
- Poligen Corp. (February 1989), a maker of pharmaceutical software.
- Transarc Corp. (May 1989), a start-up to develop AIX-based software.
- Interactive Images, Inc. (May 1989), a developer of tools that are intended for building graphical screens. IBM has unveiled a version of Interactive's Easel product that was designed to create screens for applications for the recently released OfficeVision.

DEC, under pressure, stalls bundling of DBMS, Ultrix

BY AMY CORTESE
OF STAFF

Digital Equipment Corp. has postponed plans to make public a deal that would bundle an unnamed database management system with its Ultrix operating system, an indication that it may be responding to pressure from independent DBMS vendors.

The company had previously told *Computerworld* it would make its an-

nouncement by May 16. Although DEC would not say which DBMS would be bundled, it was rumored to be Ingres from Relational Technology, Inc. (RTI).

The bundling of a runtime version of Ingres mirrors a recent DEC move to bundle its own RDB DBMS with Version 5.1 of its VMS operating system. A runtime version allows users to run applications based on a DBMS without buying a separate DBMS license.

While DEC has positioned RDB as a

strategic component of its VMS strategy, it has relied on third parties to provide DBMSs for Ultrix environments. DEC maintains a close relationship with RTI, selling that company's Ingres Tools for the VAX (VMS). DEC also supports other major third-party DBMS and tool vendors such as Informix Software, Inc., Unify Corp. and Oracle Corp.

Jim Barclay of DEC's corporate software engineering group said the Ultrix arrangement would not preclude similar agreements with other third-party software vendors.

However, a DEC spokesman said whatever the DBMS is, it will be "a Digital product — sold, licensed and supported by DEC." He added that the DBMS would be optimized for DEC's Ultrix open

systems environment, suggesting that DEC would do some modification.

The delay comes amid rumblings that DBMS vendors, including Software AG of North America, Inc. and Oracle, held discussions at a recent *Adapco* meeting on a possible lawsuit charging DEC with antitrust violations for bundling RDB with VMS.

A DEC spokesman said the firm sees no legal impediment to the bundling.

Peter Tierney, senior vice-president at Oracle, said that at the *Adapco* meeting, John Maguire, chairman of Software AG, put forth a motion that *Adapco* investigate DEC's moves in bundling the runtime version of RDB with VMS on the grounds that the action was illegal, anti-competitive and bad for the industry.

Amtrak's \$20M PC conversion gets on track

BY MICHAEL ALEXANDER
OF STAFF

WASHINGTON, D.C. — The National Railroad Passenger Corp., better known as Amtrak, plans to spend \$20 million during the next 18 months to buy personal computers for its reservation agents.

Under Amtrak's Terminal Replacement Project, 10,000 to 20,000 personal computers will replace terminals and other equipment currently used for reservations and ticketing, according to Kenneth McIvroy, director of user support and planning at Amtrak's information systems department.

"The terminals are 8 to 9 years old and have been worked really hard," McIvroy said. "Maintenance has become a nightmare; getting parts is impossible."

Amtrak is seeking bids through July that would include IBM Personal Computer ATs (with Intel Corp. 80286 microprocessors) or compatible PCs equipped with floppy and hard disk drives and communications controllers for connecting the PCs to Amtrak's mainframes, ticket printers and other equipment. The winning vendor will also provide customized windowing software that will enable reservation agents to view train schedules and other productivity tools.

IBM, AT&T leading contenders

IBM and AT&T are top prospects to win the contract because they are the only two vendors bidding on the project that have the capacity to carry out the program on a nationwide scale, McIvroy said. The terminal replacement project will begin at the end of the year and take about 18 months to complete, he added.

Upgrading the aging reservation terminals with PCs will enable Amtrak reservation agents at more than 470 reservation centers and stations across the country to reduce the time needed to handle each transaction, McIvroy noted.

"We receive 31 million calls a year," he said. "Each second that we can save on every telephone call would be like having 11 more agents working for us."

The corporation has been under pressure to reduce its dependency on federal funding, which will amount to \$584 million for fiscal year 1989.

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Sun sparks Toshiba response

BY JAMES DALY
CHICAGO

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc., will make its most ambitious gambit yet for the hearts of software developers when it reveals tomorrow that Toshiba Corp. will offer a series of low-cost personal computers based on Sun's Scalable Processor Architecture (Sparc) by early next year.

The move not only gives Toshiba a chance to penetrate the lucrative U.S. workstation market but also puts a substantial player behind the 32-bit Sparc. If Toshiba is able to crack out enough machines, it may provide a powerful incentive for a wider range of independent developers to join the ranks of those porting applications to the reduced instruction set computing (RISC)-

based Sparc platform.

"It's Sun's way of saying, 'This is going to be one heck of a party, and you're really going to want to be a part of it,'" said Dick Shaffer, editor of the New York-based "Technology Computer Letter."

Details later

Additional specifics of the upcoming machines remain fuzzy. Toshiba's manager of product planning Makoto Ihara said the company will "fill the gap between PCs and workstations." Sun officials added that the machines will include the SunOS Unix operating system and the Open Look graphical interface, developed by Sun and AT&T.

Although Sun President Scott G. McNealy asserted that the move is "complementary, not competitive," analysts warned

that a crackerjack Toshiba product could spell trouble for Sun overseas.

Sun officials, however, shrug off that scenario, claiming that they have no product that fits the specs the Toshiba machines will fill. "This is not a Sun vs. Toshiba issue; it's a Sparc proliferation issue," said Carol Broadbent, a spokeswoman for Sun.

While speculation has surfaced about the possibility of a laptop computer coming out of the arrangement, some analysts claimed that the caching requirement of a Sparc PC may be too great for a battery-powered portable.

Face in the crowd

The announcement, to be made with few particulars and at least seven months before any product arrives, may also be Sun's

way of staying noticed in an increasingly crowded market of RISC chip manufacturers.

RISC architectures are available from such companies as IBM, Intel, Compaq, Apollo Computer, Inc., Hewlett-Packard Co. and particularly MIPS Computer Systems, Inc., which has made significant strides in establishing its chip as what many consider to be the de facto RISC standard.

While such firms as Seabourne Computer, Inc. and Arite Systems Corp. have developed around Sparc, progress has been slower than Sun would prefer. A much-ballyhooed October 1987 agreement with AT&T to implement Sparc on the next generation of AT&T's high-performance workstations has so far produced little.

Sun's only other alternative may be to hand-carve its own Sparc-based PC market. "Sparc needs two things to be successful: low-cost PC and low-cost software. This fills the first part of that equation," said Michael Slater, editor of the Palo Alto, Calif.-based "Microprocessor Report," a technical newsletter. "Once the PC base is there, developers will take notice."

Toshiba, which is currently one of Sun's largest OEMs, will purchase the chips from one or more of the five semiconductor vendors licensed to develop Sparc chips. It will also license a complete software environment for Sparc/Unix-based computers from Sun. The machines will represent the first PC-class Sparc computer developed in Japan, Sun officials said.

Rivals

FROM PAGE 1

etery all the way," because of its emphasis on OS/2 Extended. While DEC embraces OS/2 Standard Edition, it will not support OS/2 Extended because that version only works with such IBM devices as communications boards, printers and monitors, he said.

"We're going to see who blinks first," Hodges said, emphasizing that IBM may have to withdraw the requirement that the OfficeVision must run on OS/2 Extended. Even for dyed-in-the-wool IBM customers, IBM's scheme is too proprietary, he asserted.

A key battleground for all the vendors is the application software packages that users will run in addition to office automation. Although many expect applications to be written for OS/2, inapplicable products have been scarce thus far. That, the vendors say, leaves the door open for competing environments.

DG and HP are following parallel strategies, working together to create a common environment built around HP's Object Management Environment, DG, HP and a number of other organizations recently formed the Object Management Group (OMG), which aims to foster application development in HP's environment.

"The key to the future is third-party software vendors," said Chris Stone, group manager of distributed applications architecture at DG. He said DG could attract third-party developers by supporting Unix and the OMG. Because of the similarity between DG and HP's strategies, many developers could write for both DG and HP environments with little extra work.

DG is reportedly rewriting its Comprehensive Electronic Office package to run on the Motorola, Inc. 68000 reduced instruction set computing microprocessor. DG said it will move all of its systems to that architecture.

DG's overall strategy is based on its answer to IBM's Systems Application Architecture (SAA), called Distributed Applications Architecture (DAA). DAA uses OSF/Motif on Unix-based sys-

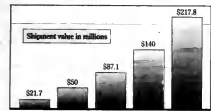
tems supports MS-DOS-based PCs on the desktop. HP said it will support OS/2 and Unix desktop devices as well, according to Ruanne Ernst, director of marketing at HP's information systems group. However, HP has yet to decide which version of OS/2, Standard or Extended, it will support.

Meanwhile, Wang stresses LAN connectivity in conjunction with its imaging products.

"We feared IBM would

Local hero

With OfficeVision, IBM is bidding for a LAN-based office systems market that is projected to grow 78% annually



SOURCE: INTERNATIONAL DATA CORP.

CHART COURTESY OF IBM

tems, Microsoft Corp. Windows on personal computers, IBM OS/2 Presentation Manager-based systems and X terminals. X terminals are dumb terminals that can perform windowing when connected to a Unix server.

Stone said DG will support OS/2 Standard only but did not completely rule out OS/2 Extended support in the future.

The major difference between DG and IBM, according to Stone, is that DG is embracing Unix, particularly as servers, while IBM is keeping Unix out of its PC line.

HP's office automation package, Business System Plus, cur-

rely supports MS-DOS-based PCs on the desktop. HP said it will support OS/2 and Unix desktop devices as well, according to Ruanne Ernst, director of marketing at HP's information systems group. However, HP has yet to decide which version of OS/2, Standard or Extended, it will support.

Meanwhile, Wang stresses LAN connectivity in conjunction with its imaging products. "We feared IBM would

lose the imaging market at the OfficeVision announcement. They didn't," said Ken Oisa, Wang's vice-president of worldwide marketing. Although Wang is working on OS/2 development, Oisa said Wang customers are questioning the need to move to it because of the cost and lack of applications. "OS/2 is being bought by the Blue Book customers only. These aren't Wang customers," Oisa said.

Wang currently boasts gateways to IBM's Professional Office Systems and Distributed Office Support Systems, and Oisa said Wang intends to develop interfaces to OfficeVision as well.

IBM's Officevision needs OS/2 Extended

BY DOUGLAS BARNEY
CHICAGO

Want to run IBM OfficeVision applications on a workstation? You'd best get OS/2 Extended Edition. In fact, you must get OS/2 Extended, a point that has some users saying "ouch."

With OfficeVision, IBM has mounted a push for its proprietary OS/2 Extended, a version of the operating system jointly developed with Microsoft Corp. OS/2 Extended, at \$450, is a necessity for the kinds of cooperative processing applications that make up OfficeVision because of its built-in communications and data query facilities, said Tony Reason, manager of integrated office offerings at IBM's Application Systems Division.

The role of OS/2 Extended was a source of confusion at the OfficeVision announcement because IBM did not specify why OS/2 Extended and PC-DOS were recommended for OfficeVision and why OS/2 Standard Edition was not. Ironically, IBM last week said that PC-DOS workstations can be into OfficeVision more effectively than OS/2 Standard Edition.

Chief among the advantages of OS/2 Extended is its Communications Manager component, which provides LU6.2 peer-to-peer networking support. Because OfficeVision workstations will be attached to a variety of host systems, other Communications Manager facilities such as IBM's 3270 emulation, 5250 emulation and the ability to handle even ASCII for external data sources are all important, Reason said.

Also, OS/2 Extended's Database Manager will be used to store documents electronically and addresses in relational data-

bases on the workstation or the back-end host computer. In most cases, users will not have the actual database engine on their workstations. Instead, they will use the Database Manager's SQL facilities to access documents or data from remote systems or databases.

With the DOS Data Base Requester, DOS workstations can query OS/2 Extended and retrieve OfficeVision documents. They cannot, however, run OfficeVision applications. OS/2 Standard workstations can neither run OfficeVision applications nor request data from OS/2 Extended.

Environmental support

"We support one of two requestor environments: the PC-DOS workstation and OS/2, which has to be Extended Edition," Reason said. He said that his understanding is that once he adds the needed communications services to OS/2 Standard, "You pretty much said what I have in Extended Edition."

The requirements for OS/2 Extended take the price in several ways. First, OS/2 Extended itself costs \$490 more than Standard Edition. It also chews up more memory, resulting in the 3M bytes of random-access memory needed to run OfficeVision. The total cost can exceed \$10,000. "It is a very expensive way to put users on word processing and E-mail," said Nancy Carlini, IS manager at FNS Sales, Inc., a drugstore chain.

IBM calculated that the minimum amount required to purchase an OfficeVision workstation is \$7,300, including a Personal System/2 Model 502 with 8M bytes of RAM, a color monitor, a Token-Ring network card, OS/2 Extended and OfficeVision.

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Three cheer net services push

BY JEAN S. BORDMAN
OF STAFF

ANAHEIM, Calif. — The movement toward increasingly intelligent carrier-based network services gained a push from three major hardware vendors last

week with introductions at the Supercomm '89 show here.

The Unisys Corp., Digital Equipment Corp. and Stratus Computer, Inc. products were designed to run end-user communications applications on traditional hardware platforms that

work in concert with big central office switches such as AT&T's SSS.

Regional holding companies are already looking to bring intelligent services such as information gateways on-line, according to Philip Quigley, chief

executive officer of Pacific Bell.

The mainframe-based systems would, in effect, be the forerunners of future Integrated Services Digital Network (ISDN) applications, said Tom Nolle, president of CIMI Corp. in Haddonfield, N.J.

Among last week's unveilings were the following:

- Unisys announced a Network Application Platform, based on a

Unisys A series mainframe, along with software that delivers voice store-and-forward, voice messaging and call-answering features.

The Unisys package could cost a regional holding company \$100,000 to \$17 million, depending on the number of mainframes installed.

- DEC announced a new and improved interface between its VAXs and central office switches, based on the Signaling System 7 standard, that is being used to route commands among ISDN switches, DEC said.

- Stratus Computer in Marlboro, Mass., announced its OSI Server, which will allow telephone companies to support directory assistance and voice messaging as well as 911 and 800 services on a Stratus XA2000 fault-tolerant system. Stratus priced the OSI Server at \$2,200 for the version running on an XA2000 Model 50 and at \$4,800 for the one running on a high-end XA2000 Model 160.

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GILLERSON ROBERT, The Runner, VG Visual Arts, Bonn, 1988. Photo: Archive for Art and History, Bonn.

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Wang ejects top execs

BY ELISABETH HORWITT
OF STAFF

LOWELL, Mass. — As part of its continuing merge-and-purchase campaign, Wang Laboratories, Inc. has let go the directors of several of its most strategic organizations in recent weeks.

A Wang spokeswoman confirmed that the following people "no longer work at Wang":

- Peter McElroy, former director of corporate communications, a 15-year Wang employee.

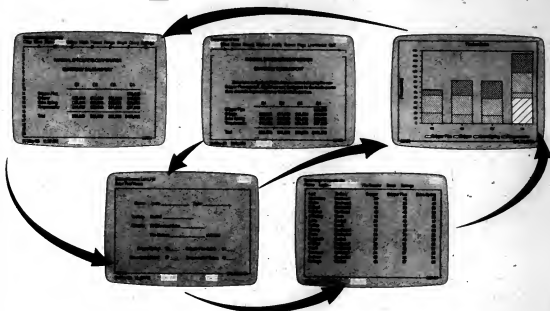
- Gus Ashton, former director of management consultant programs, who reported to McElroy.

- Tom Streck, former vice-president of the recently formed customer quality organization, which addressed the much-troubled customer relations at Wang.

Wang Director Brian Toomey will assume McElroy's and Ashton's duties, a spokesman said. Toomey, who was in charge of internal corporate communications, now has both internal and external, the spokesman added.

"Wang traditionally has had a complex, multilevel hierarchy, and I imagine one of the goals of the reorganization and layoffs is to strip away some of those levels, so not all these jobs may be replaced," said Chris Christiansen, a former competitive analysis consultant at Wang, now a director of midrange systems strategies at Westport, Conn., consulting firm Meta Group, Inc.

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than if you'd developed equivalent applications with a high-level programming language. That way, your users don't have to know how the program works, only how to perform the applications you've developed.

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Central Fidelity Is Banking On AT&T Computers.

*Left: Roger
Davidson,
AT&T Area Technical Director*

*Right: Livingston
Corporate Executive Vice President
Central Fidelity Bank
Richmond, Virginia*

Richmond, Virginia
February 2, 1989

Central Fidelity Bank is among the nation's top 100 commercial banks with \$4.8 billion in assets. Looking to extend its fourteen-year record earnings streak, the bank commissioned its data processing division to deliver a vital strategic initiative, improve productivity, enhance sales opportunities, and provide faster customer service in the bank's nearly two hundred branch offices. Jay Livingston met recently with Dean Dodrill of AT&T to review their work together.

Jay: Service is what bank customers expect. Faster service improves customer satisfaction and leads to more profitable relationships. When you speed up service, everyone is more productive, and we can spend more time with customers selling the bank's financial products.

Dean: Service and selling both depend on information. Our challenge was to provide the branches with rapid access to customer information and present that information to branch personnel in the most meaningful way. This could only be accomplished with a distributed, networked computing approach.

Jay: That's right. Our first priority was service and sales support in our branches, which meant fast, accurate retrieval and dispersal of information was crucial. AT&T's banking architecture provided that.

Dean: Early on, you talked about cost-effectiveness, return on investment, and a strategy for future growth and functionality. Remember that?

Jay: With an emphasis on profitability. We had major investments in existing systems and a lot of branches. AT&T's open systems approach didn't require trade-offs or expensive host additions, which is one of the reasons

you got the business. AT&T's creative alternatives surprised us.

Dean: The ease of networking AT&T WGS computers was fundamental to our proposal. We delivered maximum functionality, flexibility, and reliability to every workstation in each branch.

Jay: And StarLAN was a terrific way to connect and share branch resources. You made the most of our assets, including the intangible ones.

Dean: Like your customer databases—we found ways to further develop relationships with existing customers. The applications development tools we built saved time for your developers. New products and services can now be added quickly to both platform and teller software, so service and sales can continually improve.

Jay: Every bank employee associated with this system has become more productive. In my twenty-three years of banking, I've never seen a vendor provide such high-quality service and support. Central Fidelity Bank and AT&T are well positioned for the future.

The Central Fidelity Computer Solution:

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Layoff law

CONTINUED FROM PAGE 1

IS security at the New York Stock Exchange, advised, "You should either find a way to give them 60 days off and have them leave the company or find a way to track their activities."

Experts said the law is likely to affect the securities, banking, savings and loan and other industries that are experiencing layoffs because of financial troubles, mergers or acquisitions.

The first legal test of the law involves Wall Street brokerage firm L. F. Rothschild, Unterberg Towbin. A class-action suit was filed in April by 250 former employees who did not get advance notice, including an unknown number of IS employees, according to New York attorney Jeffrey G. Smith.

The Worker Adjustment and Retraining Notification Act (WARN) was passed by Congress last year — over the objections of the Reagan administration and much of the business community. Its goal is to give workers time to seek other jobs and begin training programs and to give communities time to adjust as well.

The law went into effect Feb. 4, but the final rules for interpreting the law be-

came effective only last week. The U.S. Department of Labor advised employers to look ahead 90 days and behind 90 days to determine whether employment actions — either planned or already taken — will amount to a plant closing or mass layoff under the statute.

In addition to covering layoffs, WARN covers a plant closing if 50 or more employees lose their jobs during a 30-day period as a direct result of the closing.

"Then, for example, if the 45-worker computer data entry department of a plant is closed and, as a direct result of that closing (and within 30 days of the closing), five computer programmers also are terminated, a covered plant closing has occurred," the Labor Department said.

In the 29 pages of fine-print regulation, the Labor Department acknowledged that the statute is quite complicated and that there will be ambiguous situations in which it is difficult to decide whether to give notice.

Furthermore, it is "prudent for employers to weigh the desirability of advance notice against the possibility of expensive and time-consuming litigation to resolve disputes where notice has not been given," the department said.

The rules will be enforced not by the government but through private civil lawsuits that can be filed by laid-off employees. In the suit against L. F. Rothschild, employees said they were not given proper notice and are seeking 60 days' pay and benefits, which could amount to as much

YOU SHOULD either find a way to give [laid-off employees] 60 days off or find a way to track their activities."

SALLY MEGLATHERY
NYSE

as \$2 million.

L. F. Rothschild is expected to argue that it is covered by one of the act's exceptions, which allows a faltering company to refrain from giving notice if it is trying to obtain financing for a recovery.

In simple terms

The key to interpreting regulations usually lies in the definitions of the terms, a point especially true for the rules clarifying the Worker Adjustment and Retraining Notification Act. The following are key definitions in WARN:

• **Employer:** Any business enterprise with 100 or more full-time employees. Includes nonprofit organizations and public institutions that engage in commercial enterprises, such as transit authorities and public utilities. Does not cover most federal, state or local government agencies.

• **Plant closing:** A permanent or temporary shutdown of a facility or operating unit that results in an employment loss for 50 or more employees during a 30-day period.

• **Mass layoff:** A reduction in work force (unrelated to a plant closing) that results in an employment loss for at least 50 employees or 33% of the work force.

• **Employment loss:** An employment termination other than a firing, voluntary departure or retirement, a layoff exceeding six months or a reduction in hours of 50% or more per month. Transfers and relocations are not included if the new site is within a reasonable commuting distance.

• **Affected employees:** Includes managerial and supervisory employees. Does not include independent consultants or contract workers.

SOURCE: U.S. DEPARTMENT OF LABOR

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IBM redoubles imaging market efforts

BY ROSEMARY HAMILTON
CHICAGO

IBM made another move toward the imaging market last week, this time with a small New York-based partner called Image Business Systems Corp. (IBS).

The two have agreed to market IBS' Imagen system software on the IBM RT platform; this will be the first Unix-based imaging system for IBM. IBM has been developing both mainframe and midrange imaging systems at customer sites for nearly a year.

IBS also committed to IBM's Image

Object Content Architecture, a set of specifications for image exchanges that IBM released into the public domain late last year.

So far, IBS is apparently the only company that has committed to IBM's specifications. An IBM spokesman said this: the firm made the specifications available last year but has not planned a hard push to make them an industry standard.

The relatively new imaging market has yet to establish any standards and badly needs them, according to Stephen Elliott, a partner at Arthur Andersen & Co. in St. Louis.

Elliott said that it is too early to say whether IBM's specification will catch on and noted that at this point, "No other vendor has mentioned it to me."

The RT-based system, which IBM and IBS will begin selling next month, will eventually be able to swap images with the other IBM imaging systems, according to George Febish, vice-president of sales at IBS.

However, additional transfer software must first be written. An availability date has not been set, he said.

A complete RT-based system includes Imagen system software, which manages

the image traffic and storage; the RT host; IBM Personal System/2s, which serve as imaging workstations; a scanning device; and either Token-Ring or Ethernet networks.

A setup with five PS/2s will cost approximately \$400,000.

Lotus offers LAN compatibility, pricing options

BY DOUGLAS BARNEY
CHICAGO

CAMBRIDGE, Mass. — Aiming its sights at local-area networks, Lotus Development Corp. last week announced enhanced LAN compatibility and new packaging for its key applications.

The pricing and packaging scheme is in line with the one recently announced for Lotus' 1-2-3 Release 3.0.

Later this year, key Lotus applications will begin to ship in server, standard and node versions. First off the line will be network versions of the company's Manuscript word processor and Symphony integrated spreadsheet, both slated to ship next month.

Next up will be network versions of 1-2-3 Release 3.0 and Release 2.2, each scheduled to ship 90 days after the release of the standard versions.

Most Lotus applications will be compatible with IBM Token-Ring as well as Novell, Inc. and 3Com Corp. LANs.

With the new packaging comes a new pricing scheme. In general, node versions will cost \$200 less than stand-alone or standard versions and \$300 less than server versions. The server version comes with one license for one user. Adding licenses involves paying Lotus a fee and receiving documentation.

The server versions allow for concurrent use of program code and provide data and resource sharing. As with most networking applications, Lotus will provide file-locking.

Standard editions are able to run on a network but are accessible only by one user at a time. Server editions are intended for servers and provide access to all licensed network users. Node editions are essentially sets of documentation and provide an additional user license.

Lotus has certified these products for use on Novell's SP Netware 2.15 and OS/2 Requester 1.1; IBM's Personal Computer LAN Program 1.2 and 1.3 and LAN Server 1.6; 3Com's 3+ software and 3+ Open LAN Manager 1.6; Share, Inc.'s Share 1.5; and Banyan Systems, Inc.'s Virtual Networking Software 3.0.

At the high end, you can get up to 8 accessory slots, 620 Mbytes of hard disk storage, and 16 Mbytes of RAM. And on all models, you get a choice of video solutions and the flexibility of using either 5.25" or 3.5" disks.

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Kresge develops prosthetic intended to restore hearing

Editor's note: This is one in a series of profiles of nominees for the Computerworld Smithsonian Awards, recognizing individuals and organizations that have achieved outstanding progress for society through the use of information technology. The awards will be presented in a ceremony held June 20 in New York.

BY ALAN T. RYAN
CHICAGO

ANN ARBOR, Mich.—Computer-aided design (CAD), encapsulated silicon chips and thousands of hours of research may bring new hope to those suffering hearing impairment because of the lack of the hearing sensory organ.

People with this type of hearing loss can still process auditory information once it has reached the central nervous system, but they lack the organ located in the inner ear that passes along that information. Thus, roughly 5% to 10% of the deaf population is not treatable with current hearing implants.

Research conducted at the University of Michigan's Kresge Hearing Research Institute here uses CAD software on an Apollo computer. In collaboration to design complex prosthetic devices that may allow sounds to bypass the hearing sense organ, explained David Anderson, professor of electrical engineering and computer science at the university. Anderson, one of 10 researchers involved in the auditory project, also holds a professorship in the ear, nose and throat department of the university's medical school.

Electrical stimulation

The goal of the institute's project is to deliver information about speech and other environmental sounds directly to the central nervous system through electrical stimulation, bypassing the portions of the

hearing system that no longer function, Anderson said. The prosthetic devices, designed using electrical CAD software from Mentor Graphics Corp., are intended to be implanted in the central nervous system at the point where the auditory nerve enters the brain stem.

The project would have been impossible without the use of CAD tools, according to Anderson. "The complexity of the circuit layouts and the cost of making an error in design or even in drafting requires that every possible test be applied to the designs before there is a commitment to silicone," he said.

It will likely be another two to three years before the first successful implant takes place, Anderson said. The group has been testing the devices in laboratory conditions to study their electronics and physical integrity. Once they are satisfied that a device is viable, it is tested on animals.

Even the most precisely designed implant device faces the possibility of rejection from a host system, in this case a test animal, Anderson said. But so far, he added, the tests on animals are progressing well.

"We have not achieved the long-term viability of the device that we would like to receive," Anderson said, "but the biocompatibility results look good."

During the tests, the device is stimulated so that the researchers can measure electrical responses from the animals, Anderson said.

Anderson said the group of researchers is also seeking more detailed data on what parts of the auditory system are stimulated when the unit is in use.

"This may not come until we are able to gather enough confidence to do a human implant," he said. That may be years away.

Once an implant is in place in the central nervous system, the sound would be picked up by an external electronic de-

cal research projects.

This research "is somewhat in the same category as 'orphan drugs,'" he said, referring to drugs developed for the benefit of a relatively small segment of the population.

However, he said, people today are more willing to accept the hardships of the project even though a huge number of people will not be helped. "Ethically, it is reasonable to help somebody if there is technology to do so," he said.

The Kresge Hearing Research Institute has been studying the mechanisms of hearing for a number of years, and the central nervous system project has been under way for four years.

The project, if successful, will largely benefit deaf individuals who at some point in their lives were able to hear and understand. Most patients who have had this experience processing linguistic information possess the ability to interpret signals passed to them by electrical stimulation as meaningful sounds.

However, profound deaf children without hearing experience, because of their exquisitely adaptable nervous systems, could receive benefits from an implant comparable to those for adolescents and adults with hearing experience, Anderson said.



Anderson holds hundreds of newly processed recording probes.

vice, which would translate the sound to the implant through a signal processor, Anderson said.

Anderson admits that there are some skeptics, as there are with nearly all med-

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Say goodbye to Wang 2200

BY ROSEMARY HAMILTON
CHICAGO

Wang Laboratories, Inc. last week retired the bulk of its 17-year-old 2200 line and replaced it with Intel Corp. 80386-based systems.

Wang said it adapted the old 2200 operating system to the new platform, which will enable current users to move over their applications, most of which are written in Basic.

The new CS/386 will replace all 2200s except for two low-end models, the 2200/CS 2D and 2200/CS 2N.

The 2200, Wang's first minisuper system, has an installed base of approximately 73,000. In 1972, Wang began selling the 2200 to universities and then shifted to the small-business market in the mid-1970s.

At the same time, it transferred the 2200 sales effort to resellers. In the late

1970s, Wang continued its push with resellers, particularly when the VS systems emerged as more strategic to the company, a Wang spokesman said. Today, the 2200 systems are sold exclusively through resellers.

Previous lives

The 2200 had several overhauls. Four years ago it was updated from a system with nine printed circuit boards to a single-board system. The latest version, the 2200/CS, which was repackaged to look more like a VS, was introduced in 1987.

Although based on the 80386 microprocessor, the CS/386 will not initially run the MS-DOS operating system. To maintain compatibility with older systems, Wang tailored the proprietary 2200 operating system to the new processor.

The CS/386 will begin shipping next month, a company spokesman said. Prices will range from \$7,500 to \$12,000.

EDITORIAL

Gone fishin'

IN ANNOUNCING ITS first SAA-compliant applications, IBM is like a huge trawler, setting out tantalizing lures in unsettled waters. The trawler itself is headed away from the open sea toward its own harbor, hoping to attract the big ones along with it.

The fish are wondering which way to turn. The bait is mighty tempting, and a harbor offering safe refuge from the hazards of the deep doesn't seem so bad, either.

But there is also a great allure to open waters, a promise of freedom of movement that contrasts sharply with the confines of any harbor, no matter how safe. So while few are diving for the bait, neither are they losing sight of the boat or its direction.

Perhaps one customer we spoke with said it best. Yes, the attraction of Officevision is great, but "it's all wrapped around proprietary hardware and software. You can't get around that."

Therein lies the choice that will face the big IS sites in the coming years. SAA will be anything but a panacea for those seeking to stitch together multivendor environments more effectively or for those wishing to embrace Unix strongly. But, the company says, if you are willing to play the game by its rules, IBM and its eager third-party software vendors will take really good care of you.

The SAA attractions announced to date are certainly compelling. Finally, OS/2 has a real reason for existing — namely, to provide customers with relatively seamless communications from PCs to minis to mainframes. However, this capability will come at a cost that might induce sticker shock.

Another attraction is the portability of the primary Officevision applications, such as electronic mail and calendaring, across four major hardware platforms — IBM platforms.

And a major attraction is the third-party support IBM has lined up — the same kind of support that has made the AS/400 so widely successful in an otherwise depressed minicomputer market. These third parties, which have suffered considerably in recent years, are the most zealous SAA lovers. IBM even bought into one of them, MSA, last week, perhaps as a statement that "support" is a two-way street.

But what about open systems? Isn't that what customers have been clamoring for? Aren't they searching for the Holy Grail of enterprise systems crafted from a variety of vendors' equipment, united by industry-standard operating environments and communications software?

Given how very early it is in the SAA time frame, there are more questions than answers right now, although matters clearly bear very careful watching. IS architects will face a rising chorus of cost control and systems effectiveness in the 1990s. SAA should be judged on the basis of how it alleviates the inherent conflicts between these two factors.



LETTERS TO THE EDITOR

More smoke

The article "Building blocks" (CW, April 3) describing "object-oriented programming" could not be more puzzling. Much of it reads like a traditional network database. It uses an example of an animal eating and running. How can we relate this to an insurance policy, claim or savings account? How a loan entity can hop or jump?

If functionality is the key to this methodology, where, in fact, does it reside? Is it in the database engine, program or file level? How functionality fits into this diagram is beyond comprehension.

Once again, we hear implementation is transparent to the programmer through something called "encapsulation." Sounds terrific. Where's the technical explanation on how this is achieved? Sounds like more "smoke and mirrors."

"Reusable code" is mentioned. Let's hope this is not a new concept. Otherwise, we would have to exclude much of our current database technology.

It's great stuff for a vendor's glossy brochure, but too many folks make it drafty from a technical point of view.

William A. Dukacz
Senior Database Consultant
Paramount Systems, Inc.
East Hartford, Conn.

Painful problem

Douglas Barney's "Small Talk" column (CW, April 17) used a quotation that I found particularly offensive.

The quote, referenced to be from an "IS manager," tried to draw an analogy between software spreadsheets, women and

wives. To me this is a horrific display of sexism and the mindless attitude of "the boys" populating our industry.

As a manager in the software development industry, I have tried to understand why so many of the men in our business fail to recognize the frustration and pain inflicted on our female co-workers when comments such as this get legitimized, in print or in any way.

The only conclusion I can imagine is that *Computerworld* lacks recognition of the problem. That is a shame.

Roger S. Gourd
Pepperell, Mass.

Judging trainers

"Evaluating training vendors" (CW, April 17) is quite to the point. It is extremely important that objectives be set before, evaluated during and followed up after the instruction is given.

I would like to further highlight two points where other approaches may be attempted. The first is respect to the education material to continue to serve as a reference manual. Although I agree that any written material regarding a specific subject can serve as a reference point, I believe a more prudent approach is to actually include how to use existing reference material as part of the instruction. Typically, education material only includes "bullet items" supported by some examples. Knowing how to find more in-depth information from existing reference material therefore becomes significant for the successful use of a product.

The second point is on keeping communication lines open. We have found that scheduling review sessions for specialty

technical topics in advance is extremely well-received. That is, in addition to accepting phone calls, we also return to a client site (generally a month later) and conduct an informal session where we physically review the progress the client has made to date.

In addition to helping the client, this practice also serves as a checkpoint for ourselves to be sure that we are properly presenting the material in a way that makes it possible for the attendee to successfully apply it to his job.

Loren D. Harwitz
President
Relational Software
Solutions, Inc.
Princeton, N.J.

Open or not?

Douglas Barney's praise (CW, May 1) of Sun Microsystems, Inc.'s "openness" in licensing (for a fee) its proprietary Super technology, while criticizing IBM for licensing (for a fee) its proprietary Micro Channel Architecture, seems rather hypocritical. Barney apparently has not decided if licensing proprietary technology is open or proprietary. Worse than that, he applied the rules inconsistently. Either Barney must withdraw his praise of Sun, or he owes IBM an apology.

Paul A. Rotich
Computer Consultant
Philadelphia

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Labriola, Editor, Computerworld, P.O. Box 9171, 375 Commonwealth Road, Framingham, Mass 01701.

Is there justice for all with Judge Greene?

FREDERICK G. WITHERTON



In 1984, the Bell System was broken up, and since then, Judge Harold Greene has ruled. Sometimes his rulings seem inconsistent, and he imposes many delays while deliberating over minutiae. The communications industry's ability to compete has been hindered, and users of the telephone system have suffered steadily increasing costs without receiving compensating advantages. It's time for Greene to step aside.

A recent example of inconsistency appears in Greene's rulings on applications from two companies to participate in transoceanic cable ventures. Pacific Telesis Group wanted to join a consortium to lay a new transpacific cable; Nynex Corp. wanted to join one to lay a new transatlantic cable. Both companies are devoted Bell operating companies (BOC). According to the consent decree that settled the antitrust suit and broke up AT&T, the BOCs may not undertake such ventures without permission.

After much deliberation, Greene approved Pacts's request and denied Nynex's. Apparently the distinctions were twofold. First, Nynex would have had a larger share of the consortium than Pacts.

Second, the Pacts deal supports national trade policy in opening up Japan's market, while the Nynex deal has no national policy significance.

Just a minute

There are three things wrong with this. First, no existing law or regulation specifies that BOC participation in a cable venture must be less than a certain size to be legal. Second, federal judges are not supposed to make decisions about foreign policy. Third, all BOCs will have difficulty competing internationally when every venture is delayed for months pending approval.

The National Telecommunications and Information Administration (NTIA) of the Department of Commerce recently concluded that the restrictions placed on the BOCs are having a "chilling effect" on communications research and development

and associated activity in the U.S. By prohibiting the BOCs from manufacturing, Greene's divestiture terms reduced the cash flow for R&D support to a fraction of what it was — naturally, the level has declined.

An example of Greene's minutiae can be seen in a current lawsuit. It seems Nynex fired an employee of a subsidiary called Teko Research Corp. The employee sued, claiming he had been asked to perform some consulting work that was beyond the scope permitted by the consent decree. The Justice Department took his suit to a grand jury, and Greene has been involved in hearing motions and the like.

Right or wrong, this is a trivial nuisance suit. Both Greene and the Justice Department have better things to do.

For example, on the consumer side, now the owner of every public telephone must select a preferred long-distance carrier to provide such services as charging to a credit card. These carriers may charge the caller any amount they like.

One catch

The only national-level requirement is that the carriers permit the caller to have access to his or her home carrier if the rates will be lower. Greene has said this is sufficient. But who will take the time and trouble to inquire who the carrier is and what rate will be charged?

None of this is meant to criticize Greene personally. His crafting of the original Consent Decree was a monumental accomplishment. His decisions during the succeeding five years have probably been as sensible and responsive as could be expected of any one judge. It's simply not possible to run a vast, complex, fast-changing industry from a single bench.

It's a lot harder to design the best alternative. We can't put the Bell System back together again. Completely abolishing competition is not possible, either. The Federal Communications Commission used to regulate the Bell System, however well or badly. We'd probably be better off if regulatory control was returned to it.

To help the FCC function, Congress should pass new laws spelling out more clearly what competitive freedoms the BOCs have and structuring the FCC to deal expeditiously with minor cases. An increasing number of Congressmen endorse this idea and are developing legislation to remove regulation of the telecommunications industry from the courts and return it to the FCC. They deserve our support.

There's no place like Tron City

CHARLES P. LECHT



A recent article in the *Japan Times* told of the efforts of Ken Sakamura, a Tokyo University professor, to create an electronic "mini-town" or "intelligent neighborhood." Sakamura is the originator of the highly publicized and controversial Real Time Operating System Nucleus (Tron) project now under way in Japan.

Tron has received much publicity because its goal is so startling. It is designed to create a new computer systems architecture that will change the face of

ties that will be installed in Tron City. First, there is Tron House, which is expected to be completed by the end of 1989 in Tokyo's fashionable, high-priced and highly Westernized Nishi-Shinjuku district.

We are told that more than 300 microprocessors and sensors are being built into the edifice to facilitate control of such mundane processes as turning on and off water, rice cookers, TV sets, videotape recorders, stereo components — you name it — all from one centralized touch panel. Once set up, Tron House will let your fingers do the controlling.

Tron House also features one of those paperless intelligent toi-

ets, carrying their heaviest packages, washing their desks before work and bringing "tea."

We are told that flora and fauna — once found almost exclusively outdoors — will be planted in the Tron Building for their photosynthetic powers to convert the building's interior carbon-dioxide stacks into fresh air. This is especially important in Japan, where cigarette smoking isn't going out of style by a long shot.

Now, put all this together and more: flood-in sensors, automatic lighting and "Thinking Terraces" — and you have Tron City.

Future thoughts

I envisioned myself in Tron City during the year 2000 when it is slated to receive its first inhabitants. Ready to leave my office, I issue a command for a paper file, and it arrives, carried by a cheerful robot dressed like Harold Bergman. The robot hands me my calendar while whistling "As Time Goes By." I shut off my piped-in lilac scent and program runs for tomorrow morning. I make a reservation at the Thinking Terrace for the afternoon, thank the robot and head for my car, which greets me upon my arrival with the latest traffic information — having received inputs from the road-embedded sensors.

As I drive to my Tron Home the car takes control twice, automatically averting to miss a stray dog and later, several beanie-capped kids who have been peripatetically from the pavement by their own sensor receiving devices, which were implanted in their nervous systems at birth.

I reach home and my house goes into action. Touching a panel, I set the rice cooker, instruct the bath to ready itself for my arrival, pipe in some Channel No. 5 scent and turn on an old Liberate recording.

Before bed, I follow the dimly lit trail to my paperless toilet. I am greeted by its intelligent bowl to begin a real-time session on its heated seat.

As I leave, it supplies me with my metabolic read-out, which says I'll live through yet another night, closes its lid and plays Eisei Kline Nachtsmusik as I follow the dimly lit path to bed without so much as stepping on a slapper. Another day in Tron City has ended.

"I know it sounds like science fiction," Sakamura says when talking about Tron City, "but it isn't." After the Japanese technological miracle we've witnessed over the past years, we may not even be too surprised if Tron City apartment and office rentals are not already sold out.



computing for Japan. Sakamura named his minitown Tron City, and we may expect that he intends the fruits of his Tron labors to be harvested there.

Tron City will occupy an area of one square kilometer in Ichihara, a city with a population of more than 250,000 in suburban Chiba Prefecture. It will house 15,000 residents and host some 6,000 workers. According to the *Japan Times*, all private dwellings, office buildings, transportation and other public facilities will be linked through a dedicated on-line network.

Plans call for sensors to be embedded in sidewalks, pavements and streets so that pedestrians, pets and motorists may move safely about without traffic lights. Presumably, devices will be installed in cars to receive inputs from the sensors. These will take over control from drivers to avert collisions as do today's aircraft collision avoidance systems.

Sakamura is currently working on several prototype facilities.

Lecht is an IDG News Service correspondent based in Tokyo.

A 30-year veteran of the computer industry, Witherton was a vice president at Arthur D. Little, Inc. and is now an independent consultant. He has written four books and more than 60 articles and papers.

Do IS execs need an MBA program?

READER'S PLATFORM

STEPHEN L. KOSS

It seems that in recent years MBA-bashing has become almost as popular as liberal-bashing. While this trend is not entirely without justification, a recent *Computerworld* column by Eileen Mallich [CW, May 1] arguing the irrelevance of MBA programs to information systems profes-

Koss is a managing consultant at Grant Thornton, an accounting and management consulting firm in New York.

sionals deserves a response.

First, as every MBA graduate knows, it is important to define the problem accurately. If by using the term "IS professionals" Mr. Mallich is referring to career technologists such as systems programmers, database designers or data center managers, his case is valid but trivially obvious. An MBA program certainly offers no real value to these individuals.

If on the other hand, "IS professional" refers to application designers or developers who aspire to responsible management positions, Mr. Mallich's argument requires further consideration.

We must ask what skills are needed to be a successful IS professional and a positive contributor to an organization. Furthermore, we must ask where and how these skills should be acquired.

Not so simple

We also need to recognize that an MBA program is more than just a collection of courses. MBA programs that effectively utilize the case method teach an approach to understanding and attacking business problems.

For many students, these cases are their first exposure to problems in which

the required data is not all presented nicely before them or to which there is no single right answer. Evaluating multiple viable alternatives and dealing with ambiguity and less than complete information are skills too seldom seen in IS personnel.

In addition, the wide-ranging nature of MBA programs is a virtue, not a drawback, as Mr. Mallich contends. Knowledge of the basic principles of economics, finance, accounting, marketing and production management provides IS professionals with a flexible skills base.

It is comforting to have the knowledge base already at hand for dealing with each new systems project, regardless of whether it is a manufacturing system, an accounting system or a sales and marketing system.

Perhaps even more importantly, broad-based business knowledge is critical to understanding how an application supports the organization's operations and how it interfaces with other application systems.

For example, many IS professionals do not demonstrate even the most rudimentary comprehension of how systems such as invoicing, inventory control, purchasing or payroll should relate to their organization's accounting systems.

Also, an MBA program provides "soft skill" perspectives that many IS professionals are sorely lacking. MBA courses create awareness of such issues as organizational theory, group behavior, personnel motivation, strategic planning, busi-

AN MBA PROGRAM is more than just a collection of courses. MBA programs that effectively utilize the case method teach an approach to understanding and attacking business problems.

ness ethics and two other frequently missed skills: oral and written communications. All of these skills are required to some degree from every business professional who wishes to achieve a senior level of responsibility.

I submit that IS professionals with an MBA are considerably more likely to analyze systems, applications and technology with those considerations in mind than individuals with less business background. We have all met IS personnel who hardly know (or care) what their employer's business is all about, even after years with the same organization.

Senior IS professionals are increasingly being looked to as business managers, not just as technologists. The market will continue to place a premium on those individuals who can blend these two orientations to the strategic benefit of their organizations. In fact, the time may not be far off when an MBA is almost a prerequisite for a senior IS position.

From the vantage point of my 15-year career in the IS field, I would not consider for a moment giving up the knowledge and perspective that I obtained from my MBA degree. Nor do I believe that Mr. Mallich's six-course "quick fix" is the answer. Would be equally willing to welcome into the ranks of the IS profession an MBA with a comparable six-course introduction to computer science?

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MEMO TO: M. Scott
FROM: H. Cross
SUBJECT: State Report

...support

...here's a quick update on how things have been
going in your absence. I'll make it specifically brief, after
all, your vacation isn't officially over 'til Monday.

FASHION



First, feast your eyes on this layout for the fall issue of FA. That's one of our new designs on the cover, as if you didn't know. Looks like our PR efforts really paid off.



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morning is just
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SYSTEMS & SOFTWARE

HARD
TALK

James Daly

New Cray vs. Cray Classic



Several years back, Coca-Cola laid the marketing egg of the century when it introduced a new "improved"

formula for its soft drink and pulled from the market the flavor that made the little sugar-water company from Atlanta a household name.

A once-unified customer base soon became embroiled in a debate that can be matched in modern times only by the ferociousness of the "Tastes Great, Less Filling" imbroglio.

Whether Cray Research's recent decision to carve Cray Computer (henceforth known as New Cray) out of the original firm (or Cray Classic) will cause the same customer split is debatable. But the move creates some very interesting and necessary dynamics for a domestic market suddenly racked with growing pains and self-doubt.

In less complex times, the supercomputing industry seemed deceptively simple: Cray made the biggest, bestest computer around and, along with fellow U.S. firm CDC, benevolently surveyed a pasture in which there were no serious challengers. But that situation

Continued on page 29

Hedging your software bets

ANALYSIS

BY AMY CORTESE
CW STAFF

Bankruptcy, mergers and acquisitions, natural disaster. They could happen to you or—just as bad—to your software supplier.

These days, most companies rely on software programs to run their business. So if a software vendor discontinues support for any reason, the customer is left without a means of maintaining the software. The costs associated with loss of support can be staggering when one considers the training, disruption of operations and even new hardware required to move to a new product.

While users have no control over acts of God or whether their suppliers remain independent, they can take steps to protect their investment in software.

The protection to which many users have turned in recent years is software escrow, which has been offered in an increasingly formal manner.

At Travelers Insurance Co., software escrow agreements are used to ensure that critical software applications can be maintained even if a vendor stops support. Lana Pantore, assistant director of corporate procurement at the insurance giant, said escrow is used when applications are critical to the firm's operations.

Software escrow is a kind of insurance policy that covers unexpected loss of support, whether due to bankruptcy or natural disaster. The source code and materials needed to ensure continued support of a program are

placed in the hands of a third party, to be released to the customer under specific, agreed-upon conditions that result in the loss of support.

Travelers has been using escrow agreements as long as it has been using software, Pantore said. However, it has been using software for more than the last four or five years in which it has been handled more professionally, she noted.

In the past, Travelers would place source code with an attorney, who, not being technically

sophisticated, would stow the media in a drawer somewhere and forget about it, Pantore recalled.

So if the software supplier stopped support, "we wouldn't know if the materials would be usable." Indeed, she said, "we might never gain access."

Continued on page 26

Inside

- Senate offices try out Quantum system. Page 25.
- Intel Solutions announces IBM DB2 enhancement package. Page 30.

Solbourne dishes up Sparc-based servers

BY JAMES DALY
CW STAFF

LONGMONT, Colo. — Solbourne Computer, Inc. recently broadened its line of Sun Microsystems, Inc.-compatible products with the announcement of a new series of multiprocessor servers based on Sun's Scalable Processor Architecture (Sparc) chip.

Like the earlier Series 4/800 Superserver, the Series 4/530 Workgroup Server and the Series 4/670 Departmental Server are binary-compatible with the Sparcserver 300 family recently announced by Sun.

The Series 4/530 is a five-slot under-desk processor that houses either one or two Sparc processors. It provides a processing speed of up to 17 million

instructions per second (MIPS), 16M to 40M bytes of memory and up to 2.6G bytes of mass storage, according to Solbourne officials.

The Series 4/670 is a 14-slot desk-side unit that holds up to four Sparc processors for up to 20 MIPS of power. It can be configured for 16M to 80M bytes of memory and up to 2.6G bytes of small computer systems interface storage.

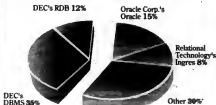
The price of the Series 4/530 models will range from \$23,200 for the uniprocessor model to \$41,550 for the dual-processor version.

The Series 4/670 line begins at \$36,700 for the uniprocessor model and runs to \$76,100 for the quadprocessor version. Both lines are scheduled to be available next month.

Data View

VAX DBMS usage

DEC's own packages make up the lion's share of commercial DBMSs used at VAX sites, but competitors are also faring well



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SOFT
TALK

Stanley Gibson

Oh SAA,
can you see?

Two years after the announcement of SAA, how far along are we to its completion? Halfway?

I asked that question of SAA mastermind Earl Wheeler at IBM's recent Officevision announcement. His answer:

"There's a lot to see in it." That Delphic response leads to two possible interpretations. One is that Systems Application Architectures (SAA) future is undoubted. The other is that SAA is destined never to achieve its potential. Both are partially correct.

The Officevision announcement went a long way to clarifying SAA's true nature. But as that fact became more discernible, SAA's exact shape became fuzzier. Wheeler acknowledged that SAA is changing and may never achieve a final form.

SAA has been likened to a blueprint. Can an architect be working on the blueprint while the building is going up?

SAA has changed in several ways since it came into the world in 1987. Operating systems OS/400 and OS/2 were added. At first, there was to be a single common-user access (CUA); now, there are three. At first, SAA's major intent appeared to be application portability. Now it is the implementation of a client-server architecture. Wheeler and others make it clear that changes can be expected in the future as well.

But having given SAA flexibility, IBM still must keep it rigid enough to have the parts work together.

Talking with some of the developers who had their wares on display at the Officevision announcement, I found that some said their applications were not compliant with SAA's CUA in certain minor respects. This came about because their existing applications, developed for specific industries, had certain attributes that could not quite be squeezed onto the procrustean bed of SAA.

IBM did not bin them from the rollout, however, because the overall look and feel of their applications were very close to the CUA look and feel — close enough so that a user would not get confused. One of the differences, for example, was that CUA specifies no more than

Continued on page 28

Senators vote for their Pick

ON SITE

BY MITCH BETTS
OF STAFF

WASHINGTON, D.C. — A small revolution is occurring in the stately halls of the U.S. Senate office buildings. Three Senate offices are using minicomputer-based office automation systems that are not on the Senate's approved list of vendors or part of the Senate's centralized computer center.

Disaffected with the Senate's standard systems, Sen. William L. Armstrong (R-Colo.), Max Baucus (D-Mont.) and Terry Sanford (D-N.C.) obtained waivers from the Senate Committee on Rules and Administration to select and install their own stand-alone systems.

Vickie Wainpinger, office manager for Baucus, explained that her supervisor is "really a computer-literate. He wanted to be able to pull up a constituent's file and see how many times that person had written and on what subjects, as well as details such as the names of the constituent's wife and kids."

In addition, the maverick senators wanted their state offices to be linked with Washington, and they chafed at the fact that the Senate's mainframe-based correspondence management system is separate from (and incompatible with) the approved Senate office systems.

In essence, the existing system had split each senator's staff into three groups: Washington staffers who answered the mail



Baucus organizes constituent contact via Quorum system

using the correspondence system, other Washington aides who used the office system and state offices with little or no automation.

This made it impossible to keep a common database on constituents, said Howard Probst, administrative assistant to Armstrong.

The situation also led to embarrassing situations, such as a Washington staffer writing to an important constituent as though he were a stranger, unaware that the voter had dealt with the senator's state office for many years.

The senators turned to an integrated system called Quorum from Intelligent Solutions, Inc. in Falls Church, Va. "What appealed to us is that Quorum does provide a common database,"

Probst said, "where [records on] every constituent that we deal with can be accessed by everybody on our staff — and that is the fundamental need of a Senate office."

In addition to integrated tracking of correspondence and casework, Quorum can be expanded to keep track of key meetings, federal appointments, academy nominations and legislative activities, according to Probst. "The basic design of the Quorum software opens up the possibility of keeping an excellent record to say you can deal with constituents on a very intelligent basis," he said.

Paul Vic, administrative assistant for Sanford, praised Quorum for its fast retrieval of constituent files by name, city or ZIP code. "If someone calls us during

a problem, I can get to their name very quickly — while they're talking — and see what their entire record is," he said.

The software also supports such applications as legislation tracking, voting records, targeted mailings, word processing, electronic mail, spreadsheets and scheduling of daily appointments.

Quorum uses Pick Systems' Pick operating system and relational database management system, running on a 32-bit minicomputer from Applied Digital Data Systems, Inc. (ADDS), a Hauppauge, N.Y.-based subsidiary of NCR Corp. The ADDS Mentor 6600 is a Pick-based version of NCR's Tower 32 line.

The system is used in 75 offices of the U.S. House of Representatives, but the vendor has modified it to meet the different needs of Senate offices, users said.

Change of heart

Initially, Baucus disdained the E-mail as well, but his side said Intelligent Solutions immediately rewrote the software to eliminate several cumbersome steps.

The fact that many of the vendor's executives and employees are former congressional aides has been a big plus. Senate users praise the vendor for understanding the unusual demands placed on legislative offices.

Users praised Intelligent Solutions for being responsive to customer suggestions and for providing prompt service and excellent training. "There were people from Quorum here for the first three months [after installation] who did nothing but sit in our office to help us," Wainpinger said.

RTI to spit-and-polish
Ingres DBMS productBY AMY CORTSE
and PATRICK WALTZYNIAK
OF STAFF

Seeking to boost its reputation as a leading tools supplier, Rational Technology, Inc. this summer will introduce another release of its Ingres relational database management system aimed at the professional application developer.

RTI's development tools have received endorsements from several computer manufacturers, including Digital Equipment Corp. and Tandem Computers, Inc., which both resell Ingres tools with their proprietary DBMSs.

Ingres 6.2 enhances the tool set and features Open SQL — a version of the standard SQL — replacing Quel, RTI's proprietary language. The major enhancements in Release 6.2

add functionality to the application-by-forms development environment and Ingres' fourth-generation language (4GL).

This release follows on the heels of a major rewrite of the Ingres DBMS last year, undertaken to make its design more modular and to support high-performance transaction processing.

The Ingres tools were enhanced to help the professional developer speed delivery of software applications. RTI's tool strategy aims to combine the advantages of both third- and fourth-generation languages to provide early prototyping and testing of applications with the power of 4GLs.

To accomplish this, the release integrates 3GL environments tightly with 4GLs. A developer can directly call 3GL routines written in Cobol or For-

tran from the 4GL, as well as invoke and use the 4GL from a 3GL environment without having to exit.

Additionally, a 4GL interpreter has been added for rapid prototyping and testing to complement the compiled 4GL used during deployment. Partially compiled applications can now be tested and deployed without waiting for the full application, according to RTI.

Developer short

The application-by-forms development environment, which connects all Ingres tools, has been given a new productivity-booster interface, replacing many keystrokes with function keys for faster development.

All application objects are stored in the Ingres Data Dictionary. Despite an agreement with DEC to jointly develop and market Ingres tools for the VAX, Ingres is not integrated with DEC's CDD Plus Data Dictionary. Instead, RTI and it is following the Information Resources Directory Standard, an evolving dictionary standard, as

a possible way to work with various DBMS dictionaries.

The dictionary has been enhanced in the latest release to enable information from it to be printed out on hard copy.

Release 6.2 is scheduled for shipment June 30 for DEC VMS environments and will be available on Sun Microsystems, Inc. and other platforms in the future.

RTI plans more enhancements to be announced during the next six to 15 months. Notable among these will be Windows/4GL, an extension of the 4GL that will allow multiple graphical user interfaces to be supported. Through use of a high-level syntax, programmers will not have to be concerned with which interface they are writing for, a tremendous problem for developers.

Also in store are "triggers" for the Ingres DBMS, which would let the program rules be programmed into the database to automatically trigger action when a specified event occurs, and an object-oriented forms system.

Hedging

FROM PAGE 23

Today, Travelers uses Data Securities International, Inc. (DSI), a San Francisco-based firm that has been a pioneer in the area of technology escrow. Pastore said that with DSI, an agreement requiring the vendor to provide updates and an envi-

ronmentally protected storage area assure that the deposit will be useful if and when released. Also, DSI has technically trained staff who inspect and verify the contents of the deposit.

Pastore said that she is more comfortable doing business with a small vendor — companies that often have the most innovative products — if she knows Travelers has access to the

source code if needed.

Dick Verville, director of business and product development at LFE Corp. in Clinton, Mass., said his firm started using escrow last year. LFE, which manufactures industrial display instruments, licensed software in 1986 to bundle with a display product it sells. The escrow agreement calls for the source code and subsequent enhance-

ments to be deposited with a third party and released to LFE in the event that the supplier cannot provide support. "We're buying assurances for the future," Verville said.

More than anything, escrow gives companies control over an unexpected situation, whether a company decides to maintain the product itself or just buy time while evaluating alternatives. "If

the rug gets pulled out from under your feet, you have time to go about it in an orderly fashion," said John Noerr, president of DSI. While DSI has been in business for several years, it has needed to release software code only 10 times. In each case, the firm decided to continue using and maintaining the software.

Caution need not be applied only to small companies. Large companies are likely to phase out mature products, according to Noerr.

For instance, in 1987, as part of a strategy to focus on IBM and Digital Equipment Corp. platforms, McCormack & Dodge Corp. discontinued support of its accounting software for the Hewlett-Packard Co. HP 3000, suggesting those customers migrate to IBM computers. The same year, Computer Associates International, Inc. dropped support of a mainframe scheduling package acquired from Uccel Corp. Uccel in turn had acquired the software — a package that competed directly with one of its own — from Cambridge Systems Group, Inc.

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How big a risk?

How do you know if you need a software escrow agreement?

According to John Noerr, president of Data Securities International, Inc., these four simple steps can help you determine your risk:

- Assess the importance of your software applications and the business' dependency on them. Is it unique and not available from another source? Is use of the application increasing?
- Does the software support your customers, so that loss of support could mean a damaged image as well as lost time?
- Assess the probability of the software developer's failure to provide support. Is the company a candidate for a takeover? Does it have high staff turnover? Is the product still actively marketed and enhanced? Is the company a small firm or a start-up?
- Quantify the potential loss and financial impact to the firm as a result of discontinued support of an application.
- Weigh the estimated risk in comparison with the cost of an escrow agreement.

May 16, 1989

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HARD BITS

Interleaf sells from HP platform

Hewlett-Packard Co. and Interleaf Corp. have announced a deal that will allow Interleaf to sell its technical publishing software on the HP workstation platform.

Interleaf plans to begin selling its system on the HP 9000 Series 300 in the fall.

ries 300 in the fall.

Tandem Computers, Inc. said it has an agreement with Information Builders, Inc. to develop and sell Focus, Information Builders' fourth-generation language database tool, for use

with Tandem's Nonstop SQL relational database management software.

Meanwhile, Volt Delta Resources, Inc., a subsidiary of Volt Information Sciences, Inc., signed an agreement with Tandem to act as a systems inte-

grator for the Tandem Nonstop systems. Volt Delta will aim at telecommunications firms in selling Tandem-based systems tailored for such functions as directory assistance and listing services.

Control Data Corp. in Minneapolis added an environmental monitoring component to the Proact Program, its service

package for Digital Equipment Corp. VAX computers.

The latest addition provides software and sensors that monitor conditions in a computer room, including temperature and humidity.

Customers can redefine parameters for an appropriate environment, and the software will automatically alert users of the existence of a problem situation.

Gibson

FROM PAGE 25

seven pull-down menus. One vendor had eight. A minor deviation, perhaps, but these were anointed vendors, and this was SAA's coming-out party. What would happen if an unanointed third party came up with a larger deviation and claimed SAA compliance nonetheless?

This is an issue that has some IBMers racking their brains. There are two camps at IBM on the issue of SAA compliance. One camp says IBM must test third-party software for SAA compliance. The other holds that such testing is difficult, costly and bound to cause problems among third-party software vendors, which may disagree with the results.

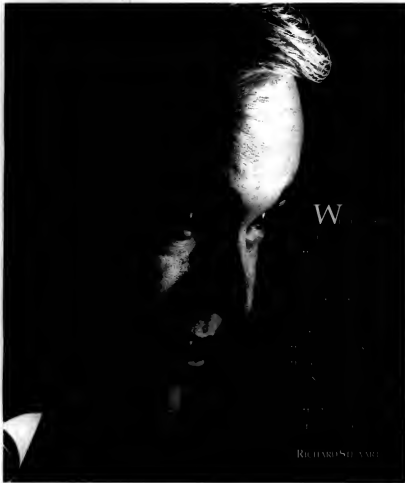
The solution for now is a sort of SAA report card. This comes with a color-coded booklet that IBM says all prospective SAA customers should ask their vendor to produce. There are boxes to be checked off in a number of different categories. Not all boxes need to be checked off for a vendor to make some kind of SAA conformity claim.

Users will have to become closely aware of a number of SAA categories and their particular significance to them. In CUA compliance, a vendor may check either CUA 1987 or CUA 1989. Wheeler said he expects there will be a CUA 1990.

But this report card may not be the final answer. Wheeler intimated that IBM may yet go further in asserting SAA compliance. He did not elaborate, but the implication was something more than a loose vendor self-evaluation. Maybe testing in some form will be done.

As of now, it is up to the user to keep up with SAA changes and make sure vendors do not stretch their claims of compliance. But users are faced with the annoying possibility that choosing between the different varieties and vintages of SAA could soon become more complicated than choosing a French wine. Further, the SAA criteria could be about as understandable to users as a French wine label is to English speakers. IBM may have to assert some "Appellation Controllee" standards.

Gibson is *Computerworld's* senior editor, software.



RICHARD STALLONE



COMPUTER CORPORATION OF AMERICA

Information Advantage Today.

Daly

FROM PAGE 23

in now ancient history. CDC's supercomputer subsidiary ETA Systems folded its tents last month, leaving Cray as the lone eagle on a technological front that has become increasingly important to both defense and manufacturing systems.

In the meantime, Japanese firms such as Hitachi, Fujitsu and NEC are not only catching up with but actually surpassing Cray in both price and performance.

Chairman John Rollwagen's decision to hedge his bets and divide the company along technological borders makes a lot of sense — except, perhaps, for the fact that the company producing computers is known as Cray Research while the one doing research is called Cray Computer.

The Internal Revenue Service willing, New Cray will emerge from the experimental gallium arsenide chip technology now being developed by Seymour Cray & Co. at the Cray-3

THE BIRTH of New Cray must certainly rank as one of the most promising start-ups in the industry.

laboratories in Colorado, while Cray Classic will expand on its highly successful silicon-based line.

In other words, New Cray will try to represent the future while Cray Classic aims to address the present.

The only thing staining the announcement was Rollwagen's claim that he has created a competitive American supercomputer industry with the stroke of a pen. If one player controls both the black and white pieces on a chessboard, does that count as competition?

But the positives far outweigh Rollwagen's gaffe. While only the great supercomputer god in the sky knows whether gallium arsenide will be a boom or bust, the birth of New Cray must certainly rank as one of the most promising start-ups in the industry.

The move marks the third time that Seymour Cray has been present at the birth of a new supercomputing venture: Before launching Cray Classic in 1972, he was one of the founding fathers of CDC in 1957.

Beyond that, however, some fundamental questions still must be answered if both companies — and the U.S. supercomputing effort that they now represent in microcom — are going to re-

main viable.

First, the Cray-3 development program has hit some unexpected snags, which have been linked to anything from problems in the uniformity of gallium arsenide crystals to glitches in the cooling system. Both investors and customers need to be leveled with before any confidence comes the way of New Cray.

Additionally, what of Cray's plans in parallel processing? Although a massively parallel architecture would be a radical departure from current architectures, there are some customers who believe that it is the only solution for providing the power they'll eventually need.

On the other end, will Cray Classic pay more attention to the

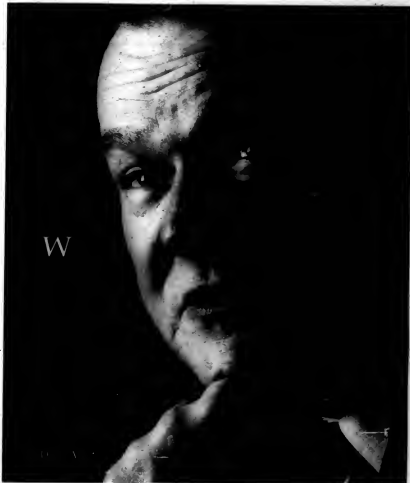
low end? With companies like IBM feeding on users who desire near-supercomputer performance but don't want to pay the price, there's apparently plenty of demand for a scaled-down Y-MP.

There's also the question of security. Some customers claim that Cray software isn't as secure as it should be. A National Computer Security stamp may

be in order.

With that in mind, it's time to sit back and see if a lonely and soft-spoken Minnesotan can once again set the outer limits of the supercomputer industry on its ear. Then, as is customary, the customer can decide which supercomputer is The Real Thing.

Daly is a Computerworld senior writer.



W

COMPUTER CORPORATION OF AMERICA

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NEW PRODUCTS — SOFTWARE

Database management systems

Inter Solutions, Inc. has released a software product developed specifically to enhance IBM's DB2 relational database system.

Called SQL-Attach, the program is targeted at database administrators, application managers and other DB2 users running batch jobs against their databases. The software makes it possible to run the batch job natively and is compatible with DB2 Version 1, Release 2 or later, the company said. License fees are scaled ac-

ording to CPU size, starting at \$6,000 for a perpetual license.

Inter Solutions
161 Highland Ave.
Needham, Mass. 02194
617-449-6322

Languages

Michaels, Ross and Cole Ltd. has announced Release 1.2 of the MRC-Productivity series, a fourth-generation language that reportedly converts SQL into an end-user tool.

The software series is a report-writing and applications development tool for end

users and programmers, the company said, and the latest release was developed especially for the IBM Application System/400 platform.

Pricing ranges from \$5,000 for the Application System/400 B10 to \$39,500 for the Model B70.

Michaels, Ross and Cole
Suite 203
450 E. 22nd St.
Lombard, Ill. 60148
312-916-0662

Applications packages

Information Builders, Inc., designer of the Focus fourth-generation language and database management system, has announced Release 4.0 of Focus, a Focus-

based project management system.

According to the vendor, the latest release contains on-line cost-account-sensitive fields for all input fields. The software package now offers support for parallel scheduling and includes time-sheet and data analysis capabilities. Focus runs under IBM's VM/CMS and MVS/TSO operating systems, as well as in the Digital Equipment Corp. VAX/VMS environment. Pricing starts at \$6,000, depending on machine size and configuration.

Information Builders
1250 Broadway
New York, N.Y. 10001
212-796-4433

An integrated asset-management software system for large financial institutions has been announced by National Computer Systems, Inc.

The Ultrast System was designed for domestic and international financial institutions, as well as those heavily involved with foreign investment transactions, the company said. The software package reportedly provides full-accrual double-entry accounting, trade-date accounting at the time of execution and multicurrency investment processing capabilities. It runs on Digital Equipment Corp. VAX/VMS systems and is priced from \$1.5 million.

National Computer Systems
400 Northridge Road
Atlanta, Ga. 30350
404-641-4100

Utilities

Legent Corp. recently enhanced its direct-access storage device (DASD) performance manager for IBM MVS systems.

Dadmon Release 2.0 automatically uncovers and analyzes I/O problems, recommends solutions and provides utilities, according to the vendor.

New features reportedly include the Online Performance Expert, designed to solve on-line DASD performance problems, and the Batch Performance Expert, designed to provide solutions to problems that occur consistently over a period of time.

Pricing for Dadmon Release 2.0 begins at \$10,000, depending on CPU configuration.

Legent
2 Allegheny Center
Pittsburgh, Pa. 15212
412-323-2600

H & A Computer Services, Inc. has introduced several migration products and services designed to allow IBM Series/1 users to move programs and data to the IBM AIX environment.

The products include an EDX/AIX emulator shell written in C that allows Series/1 users to emulate EDX running on the Series/1.

Pricing ranges from \$990 to \$2,450, depending on modules and volumes, the vendor said.

H & A Computer is also offering a source code analyzer, an EDL-to-C translator and a tape transfer facility.

Pricing starts at \$300 for the software package, and volume discounts and corporate licenses are available, the company said.

H & A Computer Services
522 Washington St.
San Francisco, Calif. 94111
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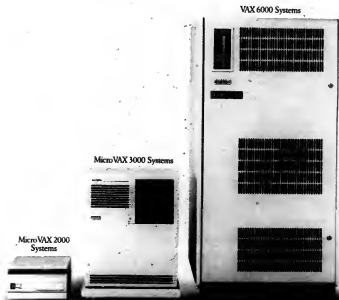
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A T E

PCs & WORKSTATIONS

MICRO BITS

Michael Alexander

Get out those picket signs



It's the 1960s all over again. At least that's what came to mind when I received a fax early last week from an outfit called the League for Programming Freedom. This group of "prominent computer science professors, computer science students, software developers and users... [planned] to picket Lotus Development Corporation headquarters... to protest litigation on computer user-interface copyright," according to the fax announcement.

If the look-and-feel controversy wasn't such a crucial issue, this grass roots effort would be a riot.

The protest, organized by such much-respected computer scientists as Marvin Minsky, founder of MIT's Artificial Intelligence Laboratory, and Rich-

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Inside

- Solomon Brothers creates pilot SQL program. Page 37.
- Olsen discusses workstation's future. Page 37.
- Compag, IBM cut memory prices. Page 39.

IBM gives OS/2-fold boost

BY DOUGLAS BARNEY
OF STAFF

NEW YORK — Hardly anyone is using either of them, but that has not stopped IBM from updating its OS/2 and OS/2 Extended Edition operating systems.

OS/2 Standard Edition 1.2, announced earlier this month and scheduled to ship by the end of September, has been dramatically enhanced. It features a new optional file system that can handle up to 16 disk partitions. Gone is the arbitrary 32M-byte limit on hard disk partitions; now, individual volumes can grow as large as 2G bytes.

The new Dialog Manager is designed to conform to IBM Systems Application Architecture interface guidelines and is intended to help the end user in-

Take/2

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- Remote data services
- Referential integrity
- DOS database requester
- Support for Cobol, Pascal, Fortran

IBM SYSTEMS DIVISION

teract with the application.

The OS/2 user interface will allow programs, including DOS,

to be represented as icons and invoked with a simple mouse click. Files can also be represented as icons. The OS/2 Standard Edition price remains at \$340. Current users can upgrade to the new version free of charge.

OS/2 Extended Edition, which lies at the center of IBM's new OfficeVision strategy, will receive many previously announced enhancements when it ships in November.

The most visible change to the Database Manager is in the Query Manager, which will exploit the OS/2 Presentation Manager. Now queries and reports can be performed with the help of icons and other graphical tools. "Our use of the Presentation Manager will buy a lot of usability improvement," said Julie Powell, database product plan-

ning manager at IBM's Entry Systems Division.

Particularly critical is Remote Data Services, which allows multiple workstations to access a common OS/2 Extended database. Individual personal computers can now work cooperatively with OS/2 Extended back-end servers. Users do not need to know where the database is located, Powell said.

IBM also added referential integrity to the Database Manager. This allows data values between related columns of different tables to remain consistent. Application programmers will no longer need to add referential integrity logic to their programs.

By adding support for Cobol and Fortran, developers can embed SQL statements within their programs. This allows programs to query an OS/2 Extended database directly. Current users can upgrade free of charge.

From college life to insurance: What Next?

BY WILLIAM BRANDELL
OF STAFF

NEW YORK — First it was a computer for college students. Then Businessland, Inc. announced that it would distribute Next, Inc.'s machine through its market channels. Now Next is being reviewed at New York Life Insurance Co., and its implementation may finally reveal the carbon-black box's true colors.

"It's the new toy at our site," said Richard Nelson, vice-presi-

dent of the New York-based concern's information systems and services department. "Now all we have to do is find a practical use for it in our environment."

Although New York Life has only one Next machine on-site, it is being given serious examination by Nelson's IS staff. Last week, New York Life performed a demonstration of the machine for its executives and department heads.

Nelson will evaluate the intuitiveness of the machine's user

interface and other aspects, such as whether users can easily integrate mainframe- or microcomputer-generated text. In addition to exploring these and other Apple Macintosh-like attributes, Nelson plans to test the voice technology in New York Life applications.

Practical machine

Initially attracted to the machine's presentation graphics and easy-to-use features, Nelson said he also believes the machine — built by Steve Jobs, Apple Computer, Inc. co-founder and chairman and president of Next, Inc. — could be a practical solution for users at any level of the insurance company.

"You don't have to be a tech-

nical guru or even know DOS commands to do something like merge files," Nelson said. "Most of our users don't want to know what the machine is doing; they just want the machine to perform the function."

The sleek machine's ease of use also makes it an ideal executive information system, Nelson added. He said the easy-to-use icon-oriented user interface complements the text management features, which are well suited to an insurance company.

"You can just imagine what it is like for someone to find a specific procedure related to an individual case," Nelson said. But with the Next machine, he said, point, click — the procedure is found.

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SMALL
TALK

Douglas Barney

Bill Gates,
superstar

This ain't no disco. The mood was about as electric as it gets in the highbrow community of

Wellesley, Mass. Those who crowded the auditorium were jittery and anxious. All seats faced a large white screen waiting to be filled with color and movement, which was occasionally obscured as stagehands whipped past to adjust a microphone.

The buzzing was not over Frank Sinatra, a Broadway play or Guns and Roses. Nay, nay. These were computer heads waiting for Bill Gates, the most famous, revered and wealthy PC whiz of all.

To members of the Boston Computer Society, who recently invited the well-heeled Microsoft chairman to speak, this was indeed a special day. To the incoherent bystander, such glory for a computer programmer was strange, a bit like attending a rock concert for prospectors.

But for the hard-core programmers in the audience, Gates stood as a symbol of hope, that one can do quite well just cranking out code. For customers, Gates is the guy who helped build a lot of the stuff in use today.

After what seemed like endless delays, the evening began. The lights in the room went

Continued on page 38

Salomon banks on SQL Servers

Multimillion-dollar deal with Sybase will launch distributed platform

ON SITE

BY PATRICK WALRZYNIAK
CT STAFF

NEW YORK—During the next year, Salomon Brothers will begin piecing together the Wall Street financial firm's future distributed computing platform, to be founded on the Sybase SQL Server.

Salomon, which recently inked a multimillion-dollar contract with relational database management system vendor Sybase, Inc., is implementing a pilot-program that will eventually place more than 100 SQL Servers throughout Salomon on various Unix platforms, including dozens of new workstations and database servers.

Before deciding to use Sybase, the firm evaluated relational databases from Oracle Corp. and Relational Technology, Inc.

Salomon plans to build a variety of applications in such areas as foreign exchange, fixed income and equity trading.

Salomon looked at the relational database industry as a whole before choosing Sybase, said Emily Suskind, a vice-president of Salomon's business technology organization and head of the data architecture group responsible for implementing the database pilot program.

Chosen for distribution Suskind, who called Sybase's SQL Server "the key to our move to distribute our systems," said Sybase's database was chosen for its distributed capabilities and the vendor's support.

"We felt that they had a very clean product architecture and that they had a very clear vision of where they wanted to evolve their product line," Suskind said.

"They also had a clear vision of how they would fit into our environment and how their technology is going to fit with other technologies in the marketplace over the next 10 years."

If all goes well with the pilot program, Salomon probably will supplement its IBM mainframe and Prime Computer, Inc. mini-computer environments with a large number of workstations, primarily from Sun Microsystems, Inc., as well as IBM's RT family.

In recent years, Salomon built several applications that not all computer users can access on its older systems. Needing a boost in productivity, the company decided to build a new database system with Sybase rather than continue to expand with the older, incompatible existing databases on IBM 3090 mainframes and Prime minicomputers.

"One of the reasons we went

with a new data architecture was the fact that we've had a huge product explosion in our industry over the past five to 10 years," said John Galante, senior vice-president at Salomon's business technology organization.

Salomon's minicomputer databases, running under Primos, are used for analysis and decision support. The IMS and DB2 databases on its IBM mainframes, which handle all of the firm's basic transactions, do not talk to the Prime systems, Galante noted.

High cost of data

In addition, Salomon's development group had to deal with the high costs associated with maintaining existing databases.

"Our business is primarily an information business, so we thought it was time to come up with a new strategy for managing data," Galante said, adding that the creation of a new database with Sybase will make more data much more accessible to a larger number of users.

"Our sales, trading, and re-

Continued on page 38

Olsen sees workstation revolution

BY JAMES DALY
CT STAFF

BOSTON—Declaring that the days of the lone worker frittering away hours on a problem are numbered, Digital Equipment Corp. President Ken Olsen predicted earlier this month that the interactive workstation market will not only stretch its boundaries of the industry but also dramatically affect the way users work.

"In most organizations, there is a tendency for secrecy because we don't like to share data," Olsen said during his keynote address to the Engineering Workstations Conference here.

"But the major contribution of the workstation is the teamwork it encourages in getting people

to work together on the same problem."

The workstation field has been one of the most hard-fought battlegrounds in the industry during the past year. Major introductions have arrived from DEC, Sun Microsystems, Inc., Apollo Computer, Inc. and Data General Corp., with each claiming to leapfrog the others' price/performance value.

But Olsen said this war of numbers is ultimately meaningless. "Things will always get faster, but it's how we work together that counts," he said during the 35-minute speech.

DEC's efforts may already be paying off. A recent report pub-

lished by research firm Computer Intelligence in La Jolla, Calif., claims that the introduction of the Declaration 3100 in January has gone a long way in helping DEC make significant gains against both Sun and Apollo. DEC now holds 32% of planned workstation purchases, compared with 16% for Apollo and 33% for Sun.

Olsen said important contributions are expected in the software end of the workstation market because workers will want sophisticated products to interact on the same database so that they can compare old work with new.

Also, Olsen said he does not see any Japanese firms challenging the dominance of U.S. workstation firms.



DEC's Olsen declares the end of the lone problem-solver

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Barney

CONTINUED FROM PAGE 37

dark, and a demo of the latest version of Microsoft Word came up on screen. Oy, not a demo! But unlike this observer, these technophiles were quite content. In fact, people spontaneously applauded twice after seeing particularly funny features. Imagine applauding a product demonstration, and a word processor at that. I guess that is what you would call Microsoft magic.

Finally, Gates took to the mike. With the buildup, you almost expected him to break out into song or dance. Instead he went patiently through a list of questions and answered each in his own diligent,

technically competent but not always satisfactory manner.

Quite often, Gates would say things that were hilarious to those of us steeped in the computer business. For instance, Gates drew howls when he earnestly suggested that Lotus Chairman Jim P. Manz would not go over big at the local comedy club.

The reception given to Gates, and the pedestal upon which he has been placed, says a lot about our industry. Gone are the days when all computers were mainframes and only MIS got to touch them. Today computers are everywhere, and the people who make the stuff are famous. The man on the street may not know Cobol, but he probably knows Steve

Jobs, Mitch Kapor and Bill Gates.

That's great for the new computer celebrities, but I'm not so sure it is great for customers. The reason many are so fascinated with Gates is that he has the industry by its diad drives. He controls, to a large extent, what we buy, use and sometimes curse at. It may be that too much power is concentrated at the top, with customers' views often overlooked while young geniuses search for new levels of software functionality.

After more than an hour, the session wound down, and I almost expected the audience to applaud if matches, hoping for an encore. At least half the audience settled on a standing ovation. One gentleman leapt about four feet onto the stage to beseech Gates for an autograph.

Gates obliged, then shielded by two associates, best a retreat. I left shaking my head.

So what did he say? Though those expecting a blockbuster revelation were disappointed, Gates did let a few precious facts slip out. Yes, Microsoft is working on new versions of MS-DOS, and MS-DOS 5.0 should be smaller and faster. Yes, MS-DOS 4.0 bugs are fixed, and yes, some of the blame lies on Microsoft's shoulders.

Yes, within "a few years," OS/2 will run on reduced instruction set computing machines. Microsoft is currently rewriting the assembly language portions of OS/2 in C to gain portability.

Gates also said that the Intel 586 will have the same architecture as the 386 and 486, so do not expect any specific 586 systems software.

Regarding the Apple suit, the worst outcome Gates could bring himself to think of involves making minor changes to the appearance of Windows. "In the absolute worst case, a few pixels go to sleep," Gates said.

Notes notes. Notes, an idea-sharing, kibitzing kind of product from Lotus that has yet to ship, is on the move. The product is just now going into early beta testing and should be out this year. The system is aimed to run on an OS/2 server, with workstations operating under the OS/2 Presentation Manager. Most of the work has been done under Microsoft Windows, but it is unclear whether a Windows version will ever appear.

Recent additions to this groupware product include access to a greater number of file structures such as an interface to Lotus' Agenda. Lotus sources said that Notes will be able to dynamically share data when it is finally released.

Barney is a *Computerworld* senior editor. PCs & workstations.

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Salomon

CONTINUED FROM PAGE 37

search groups had inefficient access to this information," he said. "Basically, we needed better productivity out of both environments. It was very costly for us to maintain all of the various databases."

Over time, Salomon will migrate many of the applications to the SQL Servers, which eventually will replace the mini-computers and perhaps more. In the meantime, Salomon plans to add workstations and a Pyramid Technology Corp. database server.

"We're taking a bottoms-up approach, talking specific product areas to work with first," said Galante, who said that although Salomon could be off its Prime databases by 1990, migration off the IMS mainframe databases may take much longer, if it is ever done.

"We're not sure we're ever going to be completely off the mainframes because we have so much [data] there," Galante said.

"We're first attacking the decision support and the front-end transaction processing, and then I think we're looking at how much of the back-end clearance function we can attack using Sybase," he continued. "The key to our decision is primarily where it is most cost-effective to use the new technology."

IBM, Compaq slice byte prices

BY WILLIAM BRANDELL

Although their intentions differ, IBM and Compaq Computer Corp. have both broken with tradition and given their customers what they could only dream about before—lower prices.

IBM struck first two weeks ago, announcing that customers who purchase memory products from them by Dec. 31 will receive a limited rebate. In a move that industry observers said was a recognition that OS/2 needs all the help it can get, IBM is also offering rebates as incentives for users to buy OS/2 applications.

IBM officials said they hope discounted memory products will help squash the argument that customers are not moving to OS/2 because its applications, such as Presentation Manager, are too memory-consuming and too expensive. IBM officials frankly stated that they are disappointed with the memory-hogging operating system's meager acceptance and are trying to lure users off the fence.

Compaq one-upped IBM last week by lowering the price of its memory products by \$100 in lieu of a temporary rebate. Compaq officials cited loosening memory chip supply as sufficient reason to pass on the savings to customers.

Compaq also lowered the price on some storage devices—for example, the 40M-byte fixed disk drive dropped from \$1,399 to \$899.

Not lured to OS/2

Some information systems managers said that neither move will affect their IS strategy or lure them into OS/2, but they enjoy the idea of lower prices and can only hope for more. "It certainly doesn't hurt," one IS director said. Analysts cast a wary eye on the IBM move, calling the OS/2 and memory rebates more of a distress signal than an incentive.

IBM customers who purchase OS/2 Standard Edition and up to a maximum of 4M bytes of memory will be refunded \$100 per megabyte. OS/2 Extended Edi-

tion buyers will receive a \$200 per megabyte refund for up to 4M bytes, and OS/2 LAN Server customers will receive a \$200 rebate for purchasing up to a maximum of 8M bytes of memory. These rebates are available on an array of IBM memory add-in products.

Compaq lowered the price of its memory products across the board by \$100 per megabyte.

IBM also announced rebates on a plethora of OS/2 applications, including a \$100 rebate on Borland International's Paradox OS/2; a \$200 rebate for Information Builders, Inc.'s PC/Focus for OS/2; a \$50 rebate for Informix Software, Inc.'s 4GL; a \$50 rebate on Lotus Development Corp.'s Agenda; and a \$100 rebate for Micrograph, Inc.'s Micrograph Designer.

Alexander

CONTINUED FROM PAGE 33

and Stallman, a top hacker and developer of Emacs, a widely used programming editor, is aimed at Lotus, Apple, Ashton-Tate and other firms that aim to copyright the look and feel of their user interfaces.

The notion that a user interface can be protected under copyright law is as absurd as trying to copyright the steering wheel and placement of pedals in an automobile, Stallman said via fax. "Drivers would have to learn a different user interface for each car, which would result in havoc on the road," he asserted. "Similarly, software user-interface copyrights will burden users with gratuitous incompatibilities and software developers with obnoxious lawsuits—unless public opinion turns decisively against it."

Lotus, however, seemed little perturbed by the visit of the league of protesting programmers. I spoke to Hedi Sinclair, the company's corporate communications czar, to find out whether the company would be manning the barricades the afternoon of the protest.

"These are not the students in Beijing," she laughed. "As far as we can tell, it will be a handful of academics. It's more of a throwback to the '60s."

Lotus thinks that software programmers should get paid for their creations. The protesters, most of whom are academics, have little understanding of how the real world functions, Sinclair said.

There has to be a common ground between the picket signs and the company's front doors. Put aside trying to decide whether Lotus, et al, can actually copyright user interfaces that were based on the work of others. Put aside trying to decide whether academicians understand the needs of business. If Lotus, Apple, Ashton-Tate and other litigants succeed, it will be bad for business and end users. The big firms will become bigger, overshadowing smaller, more innovative competitors.

It's doubtful that the legal system will be able to come up with a solution that equally applies to both creative expression of an interface and the actual implementation of that idea. Nevertheless, the software industry is willing to allow the courts to decide whose products should be marketed. You have to wonder why Lotus and the others do not seem as willing to let the marketplace decide which products are the most deserving.

Alexander is a Computerworld senior editor, PCs and workstations.

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NEW PRODUCTS

Systems

Hewlett-Packard Co. has expanded its line of Intel Corp. 80386-based personal computers with the addition of a 16-MHz desktop microcomputer.

The HP Vectra QS/165 is based on Intel's 80386SX processor and provides 32-bit internal processing, the company said. The system was reportedly designed for high-performance business applications such as desktop publishing, database management, spreadsheets and entry-level computer-aided design. It can also be used as an entry-level local-area network server or departmental computer serving as many as eight users, the company said.

A base configuration includes 1M byte of random-access memory and is priced at \$3,295.

HP
3000 Hanover St.
Palo Alto, Calif. 94303
800-753-0900

Software applications packages

Manufacturing and Consulting Services, Inc. (MCS) has cut \$500 off the suggested retail price of its Arm-1000MD computer-aided design and drafting software.

The menu-driven, 24-dimensional package is now available for \$2,495, the company said. Arm-1000MD runs on Intel Corp. 80286 and 80386-based computers and includes construction algorithms, database and drafting features.

MCS
6 Hughes Drive
Irvine, Calif. 92718
714-951-8858

A rotary file and automatic dialer for IBM Personal Computers and compatible systems has been introduced by Vertec, Inc.

Called Influence, the package reportedly can store more than 10,000 names with addresses, telephone numbers and descriptions. The information can be accessed by category, keyword or name, and numbers can be called automatically, the company said. The product is priced at \$98.

Vertec
Suite 304
3 Regent St.
Livingston, N.J. 07039
201-740-1750

A data and text storage and retrieval package for IBM Personal Computers, XT's, AT's and compatibles has been announced by E. Arthur Brown Co.

Findex V typically completes a search in about two to six seconds, the vendor said, and users may enter records in several sizes or types. This includes daily

planners, address and phone book files and customer account records.

Report and mailmerge capabilities are also provided. The product is priced at \$49.95.

E. Arthur Brown
3404 Pennine Drive
Alexandria, Minn. 56008
612-762-8847

OS/2 software

MDBS, Inc. has announced that its application development products, Guru and Knowledge-man/2, are now available under IBM's OS/2 and LAN Manager.

Guru is an expert system shell, and Knowledge-man/2 is a relational database management system, according to the company. DOS applications written in both products will run under OS/2 without any porting activity, the vendor said, and all multi-tier file- and record-locking techniques between operating systems are compatible.

Guru is priced at \$5,500, and Knowledge-man/2 costs \$695.

MDBS
P.O. Box 248
Lafayette, Ind. 47902
317-463-2581

Macintosh products

Microtech International, Inc. has announced an unlimited-capacity removable hard disk designed for Apple Computer, Inc.'s Macintosh Plus, SE and II computers.

The R45 can be used for either primary or backup storage and offers an average 25-msec access time, the vendor said. The user can reportedly store as much as 42.7M bytes of formatted capacity data on one removable cartridge. The subsystem costs \$1,099, and each unit is shipped with a 25/50-pin small computer system interface (SCSI) cable, a 50/50-pin SCSI cable and an external terminator.

Microtech International
29 Business Park Drive
Branford, Conn. 06405
800-325-1895



Microtech International R45 removable hard disk offers unlimited capacity and SCSI links

Second Wave, Inc. has announced a compact four-slot NuBus expansion chassis for the Apple Computer, Inc. Macintosh SE/30 computer.

The Expanse/30 external chassis fits underneath the computer and attaches to the machine through an interface card and cable assemblies, according to the vendor. It reportedly allows the user to operate four Macintosh II NuBus cards.

The company said that it also introduced two NuBus expansion chassis for Apple's Macintosh IIX. The Expanse N4 and the Expanse II also attach via interface cards and cable assemblies and reportedly increase slot capacity from three to seven slots and three to 11 slots, respectively.

The products are priced from \$1,295 to \$2,295.

Second Wave
Suite 260
9430 Research Blvd.
Austin, Texas 78759
512-343-9661

Development tools

An educational computer-aided software engineering (CASE) workbook product has been released by Visible Systems Corp.

The Visible Analyst Workbench Educational Version software package runs on a variety of personal computer platforms and was designed to help organizations make a smooth transition to CASE technology, the vendor said. The product reportedly employs easy-to-use graphics with common methodology integrations and is priced at \$295.

Visible Systems
The Bay Colony Corp.
Center
950 Winter St.
Waltham, Mass. 02154
617-890-2273

Collinet Software, Inc. has announced that Collinet Enterprise Computing technology has been extended to the IBM PC-DOS environment.

With the introduction of Enterprise:Builder and Enterprise:Generator, the company is targeting professional developers to provide them with a means for

building both stand-alone and co-operative processing personal computer applications. Features reportedly include data definition tools, form painting, reporting and code generation capabilities as well as debugging and communications functions.

Pricing for both products is \$4,000 per unit, and runtime versions for execution of applications and end-user reporting are available for \$250.

Collinet Software
400 Blue Hill Drive
Westwood, Mass. 02090
617-329-7700



Hewlett-Packard's HP Deskjet J11 printer boasts speeds as high as five times faster than its parent model

Training

A videotape training course for users of Lotus Development Corp.'s 1-2-3 spreadsheet software is now available from Learn PC-Video Systems.

Called Lotus 1-2-3: Beginning Through Advanced Skills, the course reportedly consists of five videotapes, five guide books and five practice disks. According to the vendor, the product is offered in all video formats and is priced from \$995 to \$1,145. Multiple purchase discounts are available.

Learn PC-Video Systems
5101 Highway 55
Minneapolis, Minn. 55422
800-532-7672

Peripherals

A personal computer-based data processing software and hardware system designed for printing checks and business forms internally has been introduced by Westcorp Software Systems, Inc.

According to the vendor, the Softforms Laser Printing System is a laser document and encoding package that can be adapted for use in the banking, payroll systems, property management, insurance and printing industries. A Hewlett-Packard Co. Laserjet Series II printer is also included.

The Softforms Laser Printing System is priced at \$6,995, the company said.
Westcorp Software Systems
Suite 100
2865 Amwiler Road
Atlanta, Ga. 30360
404-445-9709

Hewlett-Packard Co. has introduced another version of its HP Deskjet Plus printer designed to print at speeds two to five times faster than the previous model, the company said.

The non-impact device offers laser-quality output at 120 char./sec. and has six portrait fonts and four landscape fonts.

The printer comes with a standard one-year warranty and is priced at \$995.
HP
3000 Hanover St.
Palo Alto, Calif. 94304
800-753-0900

Board-level devices

Cavu Corp. has introduced the PC Board Tester, designed to reduce product development cycles for add-on boards in IBM Personal Computers and compatibles.

The board comes with a menu-driven software package and its quality-assurance personnel and technicians select the address or address range for I/O and memory reads, individually disable the I/O and memory reads and run quality-assurance tests without restarting test programs. The product can be customized for special test software applications and is priced at \$995, the company said.

Cavu
Suite 302
5711 St. Forks Road
Raleigh, N.C. 27609
919-846-9275

A graphics adapter designed for users of IBM Personal Computers, PC XT's and AT's has been announced by Boca Research, Inc.

According to the company, the Dual Graphics Adapter enables PC users to enhance monochrome monitor resolution and upgrade to an IBM Color Graphics Adapter monitor using only one adapter. Additional features reportedly include automatic mode switching and a 25-pin parallel port. The board is priced at \$99 and includes a two-year warranty and free technical support.
Boca Research
6401 Congress Ave.
Boca Raton, Fla. 33487
407-991-6237



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NETWORKING

DATA STREAM

Ellis Booker

Call 'em as you see 'em



At the time of the breakup of the Bell System in 1984, the smart money was on the long-distance network. With the end of AT&T's monopoly, most observers expected to see an influx of new players and innovative services. By comparison, the life of the local-exchange carrier, which retained its monopoly franchise after divestiture, would continue as a sleepy, predictable business.

A lot of this, we now see, was a miscalculation, proving that even the best-laid plans of progressive regulators often go awry.

While the local-exchange companies scrambled to enhance their central office-based services—and so stave off the threat of their local networks being bypassed by customers using microwave and other private facilities—the long-distance companies mostly were occupied with punishing price wars and customer campaigns. These campaigns flattened the once-impressive price differentials between us, MCI and AT&T.

On the technology front, the leading long-distance carriers—AT&T, MCI and U.S. Sprint—have tended to bring out new services almost on top of one another, further obscuring company differences. A good recent example is fractional T1 service.

Continued on page 43

DG aims wide shot at OSI hoop

BY ELISABETH HORWITT
OF STAFF

WESTBORO, Mass.—Conceding that it cannot compete on equal footing with first-string players such as AT&T and IBM, Data General Corp. hopes to win by playing on everyone's networking team as well as in the standards bullpen, according to DG section manager Kumar Shah.

As part of its campaign to provide the most comprehensive support of the Open Systems Interconnect (OSI) standard, DG last week announced support for the CCITT 802.5 Token-Ring standard, with plans in the works to support IBM's version of the protocol.

Initially, DG will provide 802.5 support for its PCI communications software, allowing DG MV minicomputers to act as servers on a Token-Ring net-

work of IBM Personal Computers and Personal Systems/2s, as well as DG's own PC compatibles, according to communications product manager Jane Ingalls.

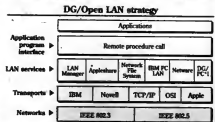
A future DG release will im-

plement IBM's Network Based Expanded User Interface (Net-beu) on MV minicomputers, Ingalls said. This will allow DG hosts to "look like an IBM node on a Token-Ring network" and

Continued on page 44

Mixed bag

DG wants its minicomputers to serve a variety of PC LAN environments



Source: Data General Corp.

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Newbridge follows NET's footsteps

BY ELISABETH HORWITT
OF STAFF

HERNDON, Va.—Following Network Equipment Technologies, Inc.'s (NET) lead, Newbridge Networks, Inc. recently became the second major T1 vendor to enter the LAN-to-WAN interconnectivity arena by way of a joint development agreement with a bridge router company.

NET set the trend earlier this year by allying with Cisco Systems, Inc. and announcing a multi-protocol bridge and router last month that is based on the Menlo Park, Calif., vendor's products. Newbridge has announced an agreement with Newbridge Communications, Inc. to develop a variety of local-area network

bridging and routing functions for Newbridge's Mainstreet line of T1 multiplexers. The products will include a learning bridge for the 3600 Mainstreet family and an integrated network management workstation.

The LAN interconnectivity market has become a competitive focal point for T1 vendors, which hope to fill up wide-area networking bandwidth with LAN-to-LAN transmissions, according to Mary Modahl, an analyst at Forrester Research, Inc.

Firms such as NET and Wellfleet bring bandwidth management to the party, allowing users to reroute voice traffic automatically over the public network when LAN-to-LAN traffic becomes heavy, Modahl said. "This is very attractive because

no one is really sure how much traffic will be traveling over LANs, but it's a safe bet that it will be bursty and heavy when people transfer files," she said.

Out of 50 Fortune 1,000 firms recently surveyed by Forrester, 44 are currently providing remote LAN links for micro-to-mainframe connectivity while 21 are linking multiple LANs across WANs, the Cambridge, Mass., research firm said.

The next couple of months should see one of the two remaining dominant players in the T1 multiplexer field—Timeplex, Inc. and Digital Communications Associates, Inc.—team up with Protoson, Inc., the only leading bridge router vendor without a T1 alliance, Modahl said.

Exploring options for CIM

BY ELLIS BOOKER
OF STAFF

MINNEAPOLIS—Executives from major manufacturers recently related how their companies have tried—and succeeded—to move away from the vaunted ideal of computer-integrated manufacturing (CIM).

Speaking at a briefing sponsored by software vendor Forth Shift, officials at Eastman Kodak Co., Control Data Corp. and Thomas J. Lipton, Inc. related how they tried mainframe-based, centralized CIM but have since opted for Forth Shift's PC software running on a local-area network.

After spending 10 years and \$66 million on a centralized CIM system, Kodak is now heading in the opposite direction. Since 1986, it has installed about 50 personal computer-based control systems at manufacturing sites.

"Decentralization is not easy. You have to rethink how to run the business," said Jack Philbin, manager of Kodak's decentralized manufacturing support systems. Philbin has become an ardent advocate of this "small is beautiful" concept. "Costly impractical madness" is how he de-

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Inside

- Micro-to-mainframe players jump to hot areas of market. Page 42.
- Open Token Foundation entering steam. Page 44.
- OSI slowly catching on. Page 44.

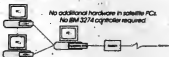
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OS/2, Macs targeted for links

BY ELISABETH HORWITT
OF STAFF

Two leading micro-to-mainframe players have migrated their products to potentially hot areas of the market: Mac-to-VAX connectivity and OS/2 Extended Edition.

Sterling Software, Inc. has announced its Presentation/Answer, which is said to allow users to extract and download data from a variety of IBM mainframe database environments and load it automatically into the files of popular software packages that support OS/2 Extended.

Answer/DB may be the first micro-to-mainframe product that is based on OS/2 Extended, as well as IBM's peer-to-peer protocol LU6.2, according to Fred Barrett, president of F.J. Barrett and Associates, an Irvine, Calif., consulting company. Major vendors such as Digital Communications Associates, Inc. and Attachmate Corp. will likely move slowly toward LU6.2 support because of their heavy investment in 3270 emulation products, according to Barrett.

However, there have been

rumors of similar announcements from software vendors who, like Sterling, support microcomputers as intelligent front ends. Spectrum Concepts, Inc., for example, should shortly announce an OS/2 Extended version of its LU6.2 communications software, XCom6.2.

ASCII and ye shall receive Microcomputer file formats supported by Presentation/Answer will include ASCII text, Lotus Development Corp.'s 1-2-3 and dBase IV, whenever Ashton-Tate Corp. announces OS/2 Extended support for the product, according to Sterling director of marketing Edward Lopez.

Mainframe database environments supported include IMS/DB, DL/I, DB2, SQL/DS and VSAM, as well as third-party products, Sterling said. Database administrators determine what data is accessible to a given user down to the field level, according to the vendor. A joining feature allows the user's view to encompass multiple relational and nonrelational databases.

The product's user interface is said to be based on IBM's Presentation Manager and to con-

form to IBM's Systems Application Architecture guidelines, including Common User Access specifications.

Scheduled for mid-1990 availability, Presentation/Answer is priced between \$18,000 and \$56,000 for a package that supports 10 concurrent Personal System/2 users.

Datability Software Systems, Inc. in New York announced an Apple Computer, Inc. Macintosh version of Remote Access Facility software that connects IBM Personal Computers to Digital Equipment Corp. VAXs. Macraf is said to enable Macintosh users to access files, applications and peripherals on remote VAXs without needing to know remote computer commands.

The software is said to support DEC's Local-Area Transport protocol and to handle multiple VT100 or VT200 VAX sessions on one screen as well as file transfer speeds of up to 120K byte/sec.

The initial release is scheduled for availability by the end of June. Pricing for the Macintosh software is \$295 per microcomputer; VAX software is priced at \$395 per Mac user.

CIM options

FROM PAGE 41

faces traditional, mainframe-based approaches to CIM.

Asked about the need for interfaces between manufacturing cells and other corporate systems, Philbin said, "I hate interfaces; interfaces are evil." He said they take time and money to install and usually have no role in day-to-day manufacturing operations. "We have gotten too clever with systems," he continued. "We have to get back to basics."

A more sensible approach, he said, is to send "financial data upstream" on a monthly basis once a month in summary form. Philbin was equally hard on centralized electronic messaging systems such as electronic and voice mail, which he said will hurt, not help, competition.

Philbin roundly criticized the old, centralized manufacturing resource planning (MRP) package developed by Kodak, which he said slavishly automated existing manual procedures instead of rethinking them and their impact on the bottom line of the business. "Every angle had thing in the old [manual] system was transferred to the new," Philbin said.

Kodak first tested a PC-based

approach to MRP in 1986 at its plastic molding plant in Rochester, N.Y. The idea, Philbin said, was to turn the 4 million square foot plant, which houses 16,000 workers, into a "street of shops," interacting with one another and the corporation much the way outside suppliers would.

A buzzword in the industry for a decade, CIM has stirred widespread interest and academic analysis but few examples of working installations at U.S. companies. Meanwhile, nations with lesser industrial muscle — notably Japan — are giving U.S. firms incentive to shift gears.

A slow CIMmer

"Only 10% of the nation's 500,000 manufacturing sites have any kind of manufacturing control system, but the majority said they plan to have CIM by the 1990s," said Jerry Bowman, vice-chairman of North Shift.

Fort Shift sells an MRP system that coordinates production schedules with customer orders and inventory controls.

Fort Shift's figures indicate the majority — or 70% — of MRP systems today are implemented on minis, with 10% on mainframes and 20% on micros. Bowman nevertheless predicts the micro MRP market will outpace that of minis, thanks largely

Look where our information systems are today.

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to the climbing power curve of network PCs and their ease of installation.

That was the experience at Kodak, where the first Forth Shift system took just 12 weeks to deploy. Philbin's staff of 10 is currently handling installations at two to three sites per week.

At Lipton's Canadian division, a decade-old homegrown CIM system was quietly undermined in 1986 when Martin S. Visagie, manager of export and logistics development, began testing PC-based manufacturing control systems.

"Nobody really took us seriously," Visagie said.

It's in the source

After evaluating more than 200 packages for 18 months, Lipton's initial system — put into its Ragù spaghetti sauce plant in Peterboro, Ont. — is now in four plants and will be in a fifth by August.

Visagie said he will achieve CIM-like integration using interfaces between the plant system and existing mainframe financial and marketing applications.

"You have to be careful not to mistake MRP for CIM," said analyst Paul A. Schneider, founder of Complicity Ltd., a manufacturing consulting firm in Barrington, Ill. "CIM is an overall un-

WE HAVE gotten too clever with systems. We have to get back to basics."

JACK PHILBIN
KODAK

brella issue." MRP is the "solution" to CIM, he said, in much the same way as a hammer is the "solution" to building a house.

Still, Schneider sympathizes with the frustration that companies such as Kodak and Lipton express: "In boardrooms, you have CEOs under pressure to do something, and they decide to do CIM. The problem is, they don't know what technologies to choose, so the tendency is to take on everything."

Echoing a point made by Kodak's Philbin and Lipton's Visagie, Schneider said companies throw money at CIM technologies without first appreciating the strategic nature of the concept. "It's hard to define CIM in terms of a box," he said. "Instead, you need to figure out how it can fulfill a strategic objective."

Booker

CONTINUED FROM PAGE 41

vices. In late April, AT&T said it was adding fractional T1 support; in May, both MCI and U.S. Sprint dutifully announced their own fractional T1 plans.

Or take products based on integrated services digital network (ISDN) technology.

AT&T was there first with its Primary Rate Interface service. But MCI has said it would have true ISDN by the first quarter of next year and offer "ISDN-equivalent" services by this fall. This leaves U.S. Sprint as the odd man out. But a U.S. Sprint ISDN product is like a summer promotional blitz by McDonald's, Wendy's and Burger King, practically assured.

Have today's long-distance companies, once regarded as the flagships of divestiture, been relegated to a commodity business? Are customers differentiating among them on nontechnology, non-price-related items like corporate image — U.S. Sprint's slick "pin drop" television commercials vs. AT&T's unblinking "slice of life" ads?

To some extent, this is true. All three are emphasizing service — read customer service — in their current campaigns, although U.S. Sprint, the only carrier with a fully fiber-optic-based network, continues to push what it claims is the superior quality of its facilities. And all three are working closely with their major accounts and beginning to target the special service needs of vertical markets like banking and health care.

But there is one technology, increasingly important to large corporate users, that could radically distinguish one long-distance carrier from another. Network management is the watchword for the '90s.

Control is the key Increasingly, customers want flexible network management tools for public facilities. Savvy and experienced about telecommunications in the wake of divestiture, they want to have the same level of control they enjoy on private networks when their data and voice traffic happens to be conveyed over "public" lines.

Some tools for this are already in place. The out-of-band signaling control of ISDN promises a standardized way of routing and monitoring traffic across networks. Many users are anticipating ISDN's promised dynamic rerouting of calls in response to changing traffic

loads or emergencies such as a network outage.

However, robust network management is tricky enough to accomplish on private networks. The ideal of controlling "virtual" private networks on public facilities that cross between different carriers and over equipment from different vendors is still being hammered out in the standards bodies and in the marketplace. All three major long-haul carriers have names for their offerings: AT&T's Unified Network Management Architecture; MCI's Integrated Network Management System and U.S. Sprint's Integrated Network System Interface and Terminal Equipment.

During the interim period before ISDN's ubiquitous solution, expect AT&T, MCI and U.S. Sprint to jockey for position with these network management services and attempt to woo large users from their private networks. To be sure, the carriers will continue their hamburger-outlet price fights, but watch for developments with these offerings to see the real direction of the marketplace.

Booker is Computerworld's Chicago correspondent.

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OSI forum carves out its niche

BY ELIZABETH HORWITT
CW STAFF

BERNARDSVILLE, N.J. — Approximately a year after the Open Systems Interconnect/Network Management Forum (OSI/NMF) was founded, several events are proving its viability as a standards body. These include ballooning membership (CW, May 15), a recent alliance with two other key standards organizations and a revved-up schedule for finalizing the specifications that will allow its member vendors to achieve OSI-based interoperability for their network management systems.

The OSI/NMF, whose membership currently numbers more than 60 network and computer vendors, was formed last July to select and recommend certain subsets of OSI protocols to ensure consistent implementations of the standard among its members' products.

"We have defined a narrow area of cooperation in order to expand the area of competition," said John Miller, OSI/NMF's president and a director of new services development and network management at AT&T. Drawing an analogy from the home video industry, he added: "Let's not waste time arguing about the size of canisters but just make good movies."

Last January, the OSI/NMF released specifications for the

Common Management Information Protocol, which defines how different network management systems exchange information. It hopes by this summer to complete message sets — the protocols that define the type of information sent — for fault and configuration management, Miller said.

This will allow vendors to "build applications in either end to interpret and adapt the information," he added.

Objects coming

Also, the OSI/NMF intends by summer's end to define a number of "objects" — the actual networking devices that will be managed, Miller said. The OSI/NMF plans to leave a lot of leeway in its definitions, however, for variations among different vendors' products, he added.

When all of the above pieces are defined, vendors can start building applications to provide integration with other companies' network management systems, Miller said. Several such products should take shape next year, he added.

Concurrent with this work, the Forum hopes to work with the Corporation for Open Systems (COS), a U.S. standards body, and its European counterpart, Standards Promotion and Application Group (SPAG), to develop product testing for conformance to its specifications.

The work will be conducted under the terms of an agreement first signed two weeks ago (CW, May 22).

"SPAG and COS are the two most influential bodies on OSI usage in general" as well as in the development of OSI conformance testing, Miller said.

The agreement may also result in IBM (finally joining the Forum, according to Michael Gering, a development programmer

at IBM's Communication Products Division in Raleigh, N.C.) IBM made a public statement several months ago that a formal agreement with COS and SPAG was a prerequisite for the vendor to become a Forum member. Digital Equipment Corp. is another fence-sitter that may be pushed into committing to the Forum by the agreement.

IBM spokesmen have suggested that there are too many standards bodies already and expressed concern that each organization would come up with its own OSI subset, forcing vendors

to develop three versions of the standard. There already have been inconsistencies in overlapping OSI specifications in the transport area, Gering said.

Regular interaction between the three standards bodies should ensure consistency of protocol definitions as well as better coordination of standards efforts, a Forum spokeswoman said. However, Miller expressed surprise at Gering's allegation. "If there are any inconsistencies [between the different bodies' implementations], they are small in nature."

Open Token group flips its hat into the ring

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — It has yet to take off, but the Open Token Foundation (OTF) is picking up some steam. OTF will stage its first forum in Dallas next month to highlight experiences of Token-Ring users.

Among other issues on the forum agenda are software and protocol interfaces, as well as future Token-Ring technology, including 100M-bit Fibre Distributed Data Interface (FDDI).

An unnamed newsletter is supposed to kick off soon, and a vendor/product directory is due out in late summer.

OTF was formed last year to promote interoperability between different Token-Ring implementations, mostly in response to proprietary changes made by IBM to its IEEE 802.5-based products.

It is estimated that IBM controls at least 90% of the Token-Ring market. Vendors are concerned that an inability to provide compatible software with IBM's Token-Ring will cost them sales. The group may also challenge the validity of Token-Ring patent claims by Olof Soderbom and his Netherlands-based company.

Formed in December, the group recently added 15 mem-

bers, bringing the total number of participants to 23. Among the new member companies are NCR Corp., Network General, Inc., Microcom, Inc., Gateway Communications, Inc., Synetics Communications, Inc., Interlan, Inc. and Vitalkit Corp.

"We are actively seeking additional members from the user community to develop a vendor-user dialogue that will help produce needed and innovative Token-Ring products," said Robert Madge, president of Madge Networks Ltd. and a co-founder and president of OTF.

The organization recently appointed its first executive director, Colin Mick, a vice-president and general manager of the services division of Lanquest Group, Inc. Lanquest was retained separately to provide OTF with ongoing administrative assistance and consultative services.

Data General

FROM PAGE 41

run applications in Netbus-compatible networking environments such as IBM's LAN Server program and 3Com Corp. and Microcom's LAN Manager, she added.

However, DG has yet to support IBM's Advanced Program-to-Program Communications (APPC) protocol for the PC LAN environment, Ingalls said. "APPC is what IBM is pushing, but right now Netbus is most predominant on PC LANs."

Another future DG release will provide support for IBM's bridging protocols for Token-Ring networks, which differ significantly from the CCITT version, Ingalls said.

DG intends to "broaden the scope of our PC integration to go beyond OSI" to proprietary networking protocols, Ingalls said. Earlier this year the vendor announced support for Novell, Inc.'s Netware. DG intends in the near future to announce support for Apple Computer, Inc.'s AppleLink as well as 3Com Corp. and Microsoft Corp.'s OS/2 LAN Manager, Ingalls said (see chart).

On the network management

front, DG intends to support "first-tier" network management systems such as IBM's Netview and AT&T's Unified Network Management Architecture (UNMA), Shah said. A DG host may eventually be able to act as a limited Netview focal point, just as IBM intends its AS/400 to perform in the future, Shah said. DG will not necessarily use Netview/PC to link its systems to Netview, however, he added.

In addition . . .

The company also intends to support Common Management Over TCP/IP, a protocol designed to allow migration from TCP/IP to OSI network management standards.

Also, DG has announced support of the OSI Common Management Information Protocol (CMIP) as a way for its network management system to interoperate with other OSI-compliant systems. DG intends to demonstrate at the Showcase '90 interoperability demonstration late next year a bridge that "goes beyond CMIP" in its ability to communicate with UNMA, Shah said.

DG hopes to differentiate its DgOpen Network Management System from the rest of the

pack — and particularly IBM — by providing peer-to-peer connections among different network management nodes. Most network management systems, such as Netview and UNMA, define a node either as a manager (in IBM-use, "local point") that controls and collects information from other systems, or as an agent that sends data to a manager.

While IBM allows one Netview focal point to send information to another, Netview does not support IBM's PU2.1 peer-to-peer networking protocol, so the system is still "basically hierarchical, with no reports distributed among multiple nodes," Shah said.

In contrast, DG's network management system allows "an agent to be a manager in its own right," collecting data from a network subsystem, filtering out extraneous data and sending on to another manager only that information that is relevant to a particular management level, Shah said.

DG/Open Network Management System currently runs on MV hosts but will be ported to DG's reduced instruction set computing- and Unix-based Arion product line next year, Shah said.

NEW DEALS

DEC net links hospitals

The Specialty Hospital Group of National Medical Enterprises has tapped Digital Equipment Corp. to tie 74 U.S. psychiatric hospitals into its Washington, D.C. headquarters. The multiyear, multi-state contract calls for the appropriate DEC VAX system and supporting peripherals to be installed at each site. Accompanying software will support integrated operations and enable SHG to consolidate financial information from all the hospitals. Ten sites already have VAX systems, with seven more to be done by June.

U.S. Sprint Communications Co. has won a multiyear contract to design and build a corporate backbone network for Apple Computer, Inc. The T1 network will link about 80 Apple locations throughout the U.S. and tie into both the public data network operated by U.S. Sprint packet network subsidiary Telenet Communications Corp. and Sprint's Meeting Channel, a worldwide videoconferencing network. According to U.S. Sprint, which did not provide financial details of the contract,

the network will account for 85%, or \$3.5 million, of Apple's telecommunications traffic.

The Britannia, a UK building society, has chosen Timesplex, Inc. to install a packet-switched data network valued at \$1.5 million. Timesplex will supply 45 T1-multiplex node processors to connect the society's 251 branches nationwide to its head office in Leek, Staffordshire. The society chose to replace a modern network with the Unisys Corp. subsidiary's packet-switching equipment to handle increasing data traffic volume and add reliability, Timesplex said.

Child World, an Avon, Mass.-based toy retailer, has selected AT&T subsidiary Tridion to install a very small-aperture terminal satellite communications network valued at \$2.1 million. Child World, a subsidiary of Cole National Co. in Cleveland, will install the network to handle electronic mail, credit authorization, price lookup and point-of-sale updates traveling between headquarters and 175 stores in the Midwest and Northeast.

MANAGER'S JOURNAL

EXECUTIVE TRACK



Pat J. Menesely was promoted to vice-president of corporate information services at Wheeling-Pittsburgh Steel Corp. in Wheeling, W. Va.

Menesely joined Wheeling-Pittsburgh in June 1988 as information services officer. He had 14 years of experience in IS management at major corporations, most recently at Kimberly-Clark Corp. in Duluth.

Menesely holds a master's degree in human resource management from Houston Baptist University, a master's in business administration from the University of Pittsburgh and a bachelor's degree in business systems analysis from the Indiana University of Pennsylvania School of Business. He lives in Bridgeville, Pa.



Barbara Halek was promoted to vice-president of information systems and distribution at Howard W. Sams & Co. in Indianapolis, a technical publishing division of Macmillan, Inc.

Halek is responsible for IS, shipping, customer service, order entry and electronic publishing at the company's several publishing divisions.

Halek has been the company's director of IS for the past seven years. Previously, she was manager of program development at Anacostia, Inc. She holds a bachelor's degree in mathematics from the University of Detroit.

Who's on the go?

Changing jobs? Promoting an assistant? You want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor/Management, *Computerworld*, Box 9171, 375 Commonwealth Road, Framingham, Mass. 01701-9171.

IS bridge over oily waters

Kendziorek's hedgepodge of computers works to calm Valdez spill from field outpost

BY J. A. SAVAGE
CW STAFF

Every information systems department has days that seem like a nightmare. But that's the daily routine for Marshal Kendziorek, data coordinator at the Alaska Department of Environmental Conservation.

On the day after the Exxon Valdez oil spill disaster in late March, Kendziorek was pulled from his office in Juneau and sent to the scene to create a remote office with whatever computers were available.

Now inhabiting a temporary office site in a corner of Valdez's American Legion Hall, Kendziorek is still there, mapping the leading edge of the oil 500 miles away and keeping the department's ad hoc jumble of computers and peripherals running.

Relief squall

As in the field office of a large battleground, confusion reigns in the temporary office. Researchers, recently disgorged from helicopter and small plane overflights of the spill, rush in and out, dispatching the latest maps to be entered into the department's database. Orders are shouted over walkie-talkies, and secretaries desperately try to keep track of who is where at any given moment.

amid this seeming chaos, Kendziorek stays calm, helping the support staff manage bulky printers and tending to the myriad requests for information from environmentalists, Native American organizations and state and federal agencies.

He points to a time card that shows he worked a 23-hour day on April 1 and says this is typical of his recent schedule. Despite long hours, he takes satisfaction in the fact that Exxon Corp. has given him a blank check to buy whatever

equipment is needed for the temporary office and is covering the overtime hours of the 25 staff members.

No amount of money, however, can move equipment easily in the still-frozen north. Weather often closes the tiny airport in Valdez, and ground transportation to Anchorage is a six-hour trek at best. Kendziorek urges staffers coming in from larger cities to bring supplies with them. "I had to make a trip to Anchorage just to get

stocked makeshift kitchen.

Observers say that the self-sufficing Kendziorek is automating operations far more than any other effort surrounding the spill.

"Other agencies collected data and would enter it in [to the microcomputer] when they got a chance. The thing Kendziorek did was to get the information almost in real time," says Fritz Funk, statewide herring biometrician at the Alaska Department of Fish and



MICHAEL SMITH

diskettes and plotter supplies," he says.

Kendziorek overcame some early difficulties, such as having to sleep on the office floor for a couple of weeks. He now has gracious quarters by Valdez standards, with a room in an extra-wide trailer. Many cleanup workers have nothing more than pup tents to shelter them from the harsh Alaskan spring. The IS department tries to avoid interminable lines for food at the few restaurants in town by providing a

Game. Funk used maps generated by Kendziorek to plan where to carry out herring spawning studies, because herring mating season began shortly after the spill.

Gathering clues

In addition to mapping and office functions, Kendziorek's department has a database of "evidence" from the spill.

"It existed from the second day on," says Doug Martinson, an analyst

Continued on page 47

Treating the problem, not the symptoms

BY ALAN J. RYAN
CW STAFF

When the going gets tough, the tough get going. But sometimes it may be too late. Compelling events such as increased foreign competition and deregulation are too often the impetus for companies to invest in information systems.

"By reacting to difficult circumstances," said Pat Mullin, director of information systems marketing at Digital Equipment Corp., "companies do not have the opportunity to follow the kind of rational business decision process they would normally use for a major investment decision." He was

speaking at a recent Profit-Oriented Systems conference in Cambridge, Mass.

Fighting fire with fire

The challenge is to improve the effectiveness of an organization through investment in technology. But too often, he said, companies use technology to solve technological problems.

Mullin said that studies commissioned by DEC have shown that IS spending per employee has grown by as much as 7% during the last 10 years but that productivity gains have not increased incrementally.

Why? Because the spending has not been careful spending, he said.

Another study showed that for more chief executives, human re-

source concerns are the top priority. Thus, Mullin said, "Technology that is not applied to solving the problems of people in business is misapplied." By bringing the technology to the areas of concern, productivity gains will be obvious.

It can be done. For example, Mullin said, if finding and training customer support people is an ongoing challenge at a company, then the information systems group could design and implement an expert system for customer support.

The expert system could "take up the slack" in the organization by providing on-line product and support information to customer support representatives or, possibly, directly to customers.

TAKING CHARGE

Les Gilliam

CASE not for everyone



For many years, the principal problem in the information systems world has been the lack of a standard, disciplined and organized approach to the development of application systems that would yield predictable, quality products.

The emergence of an "engineering" approach to the problem is now becoming a reality in the form of computer-aided software engineering (CASE) tools.

But CASE is not magic and is not a panacea. It will not solve the problems of weak management, inadequate staff skills, uncooperative attitudes or a lack of credibility with clients. It will only exacerbate such problems.

The companies that have achieved success with current development tools are the ones with a high probability of success with CASE. The others are likely to fail — and spend a lot of money in the process.

The initial CASE effort should be considered research and should be executed carefully. One major company interviewed more than 50 other companies regarding the use of CASE before finalizing its plans. Its pilot project was quite revealing.

It should be no surprise that CASE products and staff training can be quite expensive. But many are surprised by the significant outlay required for increased mainframe power and desktop workstations.

CASE products require an extensive learning effort. There are so many new terminologies and new concepts that analysts have to go through an "un-learning" phase. Management should not expect too much too soon.

Comments to users should surely be tempered. IS representatives should not state or imply that these tools will solve all the problems between users and IS.

CASE must be introduced and implemented in an orderly manner to gain the support and cooperation of all concerned. To try to force a drastic change will lead to failure. Experienced users have reported that their companies suffered a serious "culture shock" when CASE was implemented.

CASE users have also stated

that a firm methodology should be in place before the technology is brought in. A good methodology should prove useful in either the CASE or non-CASE environment.

It should also be adaptable to applications on the mainframe, departmental or personal computers. The methodology should be useful to both the IS development staff and developers in

the user community.

There has been much discussion recently about large IS shops moving toward a distributed environment in terms of computing resources, application development and processing control. To do this, IS management endeavor to determine how or if CASE can be successfully utilized in both the centralized and distributed develop-

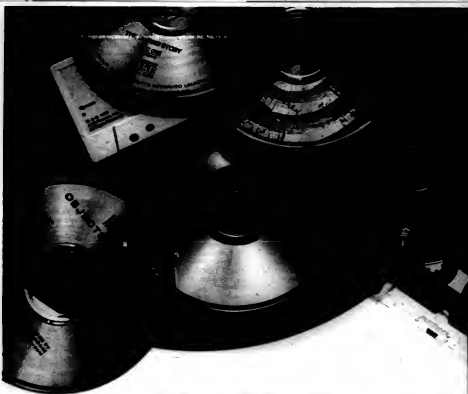
ment environments.

CASE technology is new and developing. Many products are on the market now, and more are sure to come. Other vendors are likely to enter the field.

New CASE users should be very careful in selecting a vendor and in choosing the CASE products because of the required long-term commitment. Since they will be making a large in-

vestment in software, hardware, training and analyst time, they cannot change products or vendors whenever a new or better product is announced. So it will pay to deal with a vendor that will continually improve its products.

Gilliam is president of Gilliam Associates, a computer management consulting firm based in Pease City, Ohio.



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Oil

FROM PAGE 45

and programmer. "It has information such as where a particular roll of film or videotape may be and what is on it. It has field notes, 70,000 water samples and daily staffing rosters."

Kendziorek, who has a background in biology, was always at-

tracted to computers. "My forte was mathematical modeling of ecological systems," he says. He proudly announces that he still has one of IBM's first personal computers—"serial No. 245."

He began his IS career with the state of Alaska five years ago. "It was either that or wait for jobs with all the other biologists," Kendziorek says. He set up local-area networks for two

offices in Anchorage and Juneau using NCR Corp. 3390s. He was working on a third regional office when the Valdez oil spill occurred.

PC spree

Kendziorek bought two personal computers in town, brought one more from home and boarded a plane bound for Valdez in the span of two hours.

The IS operation that Kendziorek has established since then is nothing fancy, but it is at the spill site, and it is working. Exxon did not have mapping systems up and running until April 15, according to Ron Goodman, Exxon's manager of surveillance at the spill. Currently, Exxon has two PCs to generate customized maps.

Kendziorek's secret was to

keep the systems small. Until mid-May, he had seven Compaq Computer Corp. machines based on Intel Corp.'s 80386 processor and about seven more laptop computers of varied origin. Then, he installed nine NCR 3390 networking workstations running Novell, Inc.'s Netware 2.

When he arrived March 25, Kendziorek took his three com-

FOR THE first few days, we had all 11 million gallons right here in only 40 square miles. Then, there was a storm. It took off and just flew."

MARSHAL KENDZIOREK
ALASKA DEPARTMENT
OF ENVIRONMENTAL
CONSERVATION

puters and began work immediately, with some well-timed help from oil spill expert Erich Gundlach, president of Narragansett, R.I.-based E-Tech, Inc. Gundlach arrived the next day with mapping software from Generation 5 Technology, Inc. in Denver. He did not have the expertise to use the software, which he had obtained only two weeks before the spill, so he and Kendziorek developed command skills through trial and error.

Kendziorek's first duty was to map the spill. "For the first few days, we had all 11 million gallons right here in only 40 square miles," he says. "Then, there was a storm. It took off and just flew."

"There was a lot of different data taken about what was actually being hit. To make it worse, we were just starting to learn Autocad," Kendziorek says. Kendziorek and Gundlach's maps grew more detailed as they adapted to the mapping software packages.

Mapping the course
Kendziorek, meanwhile, had to get plotters to draw the maps and more PCs and peripherals to handle the information demands on the department. In the early days of the spill, he also did his own flyovers to determine where the spill was heading. "From 500 feet up, you could smell it," he says.

Kendziorek would like to return home to Juneau and finish the networking project he was working on when the spill occurred.

The oil, however, is not cooperating. It continues its 500-mile path southeast, and the cleanup has hardly begun.

"When will he be able to close?" Kendziorek says. "That's the great unknown."



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CALENDAR

The imminent collisions between powerful workstations and lower cost personal computers will be the theme of a conference by The Yankee Group called Sparcintosh.

The two-day program, to be held July 25-26 in San Francisco, will focus on the purchasing trends of large users. The program will cover such issues as channel conflict, customer direction, software direction, technology direction and market definition. For more information, contact Corey Green at The Yankee Group, 200 Portland St., Boston, Mass. 02114.

JUNE 4-10

CPA-2002 Joint Conference. Anaheim, Calif., June 4-5 — Contact: Pat Johnson, The Manual Society for Computer Applications in Engineering, Planning and Architecture, 5 Park Ave., Gathersburg, MD 20877.

IBM Information Partnerships and Competitiveness Advantages II. Arlington, Va., June 4-6 — Contact: Phil

For Publishing, 7811 Montrose Road, Potomac, Md. 20854.

Automated Government Benefits Symposium. Washington, D.C., June 5 — Contact: Ann Jensen, American Bankers Association, 139 Connecticut Ave., N.W., Washington, D.C. 20005.

Northwest Profs Users Group (NPGU) Spring

Meeting. Irvine, June 5 — Contact: Hal Stevens, John Hancock Financial Services, T-16 Info Center, P.O. Box 111, Irvine, Mass. 02117.

The Intelligent Corporation Conference. New York, June 5-6 — Contact: The Rich Street Forum, Suite 1301, 444 Park Ave. S., New York, N.Y. 10014.

Data and Process Modeling '89. Arlington, Va., June 5-7 — Contact: Servant Data Systems, 19 Oakleaf Way N., Rockville, Md. 20854.

Data Communications Concepts. New York, June 5-7 — Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

On-Line Transaction Processing Symposium. Boston, June 5-7 — Contact: Digital Consulting, 4 Winter St., Andover, Mass. 01810.

Personal Computing Conference Implementing the User Workbench. Monterey, Calif., June 5-7 — Contact: Ashley Peters, Gartner Group, P.O. Box 10212,

Stanford, Conn. 06904.

A/R/E Systems '89 Computer and Management Show for the Retail and Consumer Goods Industry. Anaheim, Calif., June 5-6 — Contact: A/R/E Systems '89, P.O. Box 11314, Newport, Conn. 06111.

AIMS Show and Conference. San Francisco, June 5-6 — Contact: Association for Information and Image Management, Suite 1100, 1100 Wayne Ave., Silver Spring, Md. 20910.

Intelligent Mapping '89: A Conference on Computer Software and Hardware Used for Geographic Information Systems. Anaheim, Calif., June 6-8 — Contact: AIMS Group, Suite 425, 11194 Berrante Plaza Drive, San Diego, Calif. 92138.

Network Computing Forum. Ann Arbor, Mich., June 6-8 — Contact: HWP Headquarters, Suite 525, 101 N. Main St., Ann Arbor, Mich. 48104.

Computer Security Workshop. New York, June 6-9 — Contact: The International Association for Computer Systems Security, 6 Sweetwater Lane, The Hills, N.Y. 11746.

Impact of Information Technology on Financial and Information Systems Management. Bedford, Mass., June 7 — Contact: Society for Information Management, Boston Chapter, P.O. Box 116, Newton Lower Falls, Mass. 01862.

Society of Manufacturing Engineers Educational Clinic. Los Angeles, June 7-8 — Contact: Society of Manufacturing Engineers, One SME Drive, P.O. Box 690, Dearborn, Mich. 48121.

Systems 88 Expo. Marlboro, Mass., June 7-8 — Contact: System 88 Expo, 27 Congress St., Salem, Mass. 01970.

Hardware Resources Planning. Chicago, June 7-9 — Contact: The Institute for Information Management, P.O. Box 261504, Milpitas, Calif. 95035.

Small Computer Systems Conference. Monterey, Calif., June 7-8 — Contact: Gartner Group, P.O. Box 10212, 50 Taylor Road, Stanford, Conn. 06904.

Electronic Data Interchange Conference. Washington, D.C., June 8-9 — Contact: Press & Sullivan, 150 Fulton St., New York, N.Y. 10038.

Managing Technology as a Strategic Resource. Pasadena, Calif., June 8-9 — Contact: California Institute of Technology, Industrial Relations Center, 1-90, Pasadena, Calif. 91126.

MOBA Arts Conference. San Jose, Calif., June 9-10 — Contact: National Computer Graphics Association, Suite 200, 2723 Marlette Drive, Fairfax, Va. 22031.

JUNE 11-17

MACS — Managing Apple Computers in Information Systems. Chicago, June 11-13 — Contact: Mary Jo Rasmussen, MACS, Suite 400, 111 E. Wacker Drive, Chicago, Ill. 60601.

Report Communications '89. San Francisco, June 11-14 — Contact: Graphic Communications Association, Suite 604, 1730 N. Lynn St., Arlington, Va. 22209-3068.

IO '89 Annual Conference. Dallas, June 11-14 — Contact: Elva Torres, 2520 Commander Drive, Carrollton, Texas 75006-2007.

National Price Users Group Conference. Anaheim, June 11-14 — Contact: NPGU, P.O. Box 997, Laurel, Md. 20707.

Business Opportunities in Rural Telecommunications. Arlington, Va., June 13-15 — Contact: Science World, P.O. Box 1405, Alexandria, Va. 22313-2055.

CISX Managing Availability and Performance. St. Louis, June 13-14 — Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

Computer Graphics for Design. New York, June 13-14 — Contact: The Center for Computer Graphics for Design, 40 Stephentown Drive, Haverhill, Mass. 01831.

International Trade and Communications Conference & Exhibition. Washington, D.C., June 13-14 — Contact: Eugene A. Reilly, Executive Director, NCTDA, Suite 300, Silverdale, N.Y. 11735.

Software and Computer Output-Optimized Programming (SOOP). Irvine, June 13-14 — Contact: The Wang Institute of Survey University, Corporate Education Center, 72 Tyng Road, Tyngsboro, Mass. 01879.

Personal Computing Conference. Toronto, June 13 — Contact: International Data Corporation Canada, Suite 1400, 7 King Street E., Toronto, Ont. Canada M5C 1A5.

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PRODUCT SPOTLIGHT

PRINTERS AND PLOTTERS

Users stay cool amid whirl of options

BY JOHN WEBSTER

No two ways about it, printer purchasers are a hard lot to tempt. Manufacturers keep coming up with tasty new concoctions and exotic side dishes to whet in front of them, and they will ooh and aah in appreciation of the R&D feats, inquire about the price and then move on to plainer and more proven fare. "Take out some of the price points," they say, "and prove that its resolution is better than what you turned out yesterday and maybe we'll take a bite. Until then, we'll pass."

If you are looking for an equivalent, think in terms of iron-willed dieters, bargain outlet shoppers and hard-core consumerists.

Consider ink-jet technology. Some industry analysts see ink-jet as a rising star. It may very well be, but stars in this particular area do not shoot so much as edge toward acceptance.

Ink-jet technology has a lot going for it in terms of both quality and price. These printers are a "good alternative for users who want laser quality, but don't want to spend a lot of money," according to Keith Kneitz, a market analyst at BIS CAP International, Inc., in Norwell, Mass.

With an average price tag of around \$1,000 for solid ink-jet technology, high-resolution and color potential, ink-jet units in the 300 dot/in. range are beginning to make an appreciable dent in the 24-pin dot matrix market. But it has, after all, been 10 years since the first office ink-jet printer hit the market, and even now, its success is not quite locked in.

Some problems do linger.

Webster is a Boston-based free-lance writer.



JOHN WEBSTER

such as the tendency for images to bleed on plain paper, often requiring special clay-coated stock to maintain image quality. So knowing the quirks of the marketplace, most analysts, including Kneitz, confine themselves to saying that this is a technology that bears watching.

In the meantime, potential buyers are winning more options by playing the waiting game. Manufacturers of printers employing other page printing tech-

nologies—primarily laser, LED and liquid crystal shutter—are pushing for higher resolutions in their print engines.

Canon recently improved the laser printer resolution standard by demonstrating a 400 dot/in. engine, which should be available in a printer in the future. Industry heavyweights Hewlett-Packard Co. and Apple Computer, Inc. will soon be testing these waters with 400 dot/in. laser printers, according to Steve

Terry, co-director of the research center at Electronic Directions, a desktop publishing consulting firm based in New York.

Printer manufacturers claim that resolutions as high as 600 dot/in. will be commonplace in about three years, but such products will require reworking the printer engine. Currently Varityper and Printware, Inc., among other companies, are tweaking the Canon engine for 600 dot/in. output, but the compromise is dot-placement accuracy, according to Donald Parker, vice-president of products and technology at QMS, Inc. in Mobile, Ala.

"The [current] photosensitive materials forming the drum surface have a minimum charge they can support, and the toner itself has to be much finer than what is found in print today,"

INSIDE

Old Faithful

Pen plotters lose steam but still draw dependability fans. Page 54.

High Gear

Speed may be the least of high-volume printer users' concern. Page 55.

More Than a Pretty Face

True network printers need the basics—and then some. Page 56.

Further explain.

The quest for higher quality is not limited to nonimpact printers. Impact printers, facing the encroachment of nonimpact printers into traditional impact territory such as heavy-duty report processing and other high-volume work, are rising to the challenge by trying to match the quality of the nonimpact.

Now that 24-pin printers have taken a firm hold on the dot matrix market, there is some speculation that higher pin counts may surge. For example, a 48-pin printhead was introduced by Epson in Japan earlier this year. The prevailing thought around the industry, however, is that 48 pins will not offer enough benefits to outweigh the accompanying increase in cost.

Angelo Boyd, manager of printer research at International Data Corp. (IDC) in Framingham, Mass., explains that the quality will have to be "almost laser-like" and the price much lower in order for 48-pin dot matrix printers to make a heavy impact on the market.

One method being developed by dot matrix printer manufacturers to produce better print quality is a dual-pin, double-density mode for 24-pin models.

"We'll start to see 'super letter quality'; it will be the next level and come very close to laser quality," says Charles Gephgrin, director of impact printer product marketing at OkiData Corp.

In general, impact printer manufacturers will attempt to lure buyers with enhancements to existing technology, because "there's not a whole lot of breakthrough left" in the dot matrix category, BIS CAP's Kmetz explains. Paper-handling features such as paper parking and different types of paper feeds, which were considered options at one time, will become requirements.

Color vs. sensitive

The market for color output continues to improve, albeit slowly. Exceptional color quality is still beyond the reach of many office budgets, but splashes of color are appearing more frequently in office documents.

In the last year, color has become more accessible—at least technologically—as ink-jet, dot matrix and laser color printers have come onto the market. In addition, improvements such as dye-diffusion thermal transfer and solid ink-jet have allowed those technologies to take off. But while resolution is not always a problem, cost and speed usually are.

Even though color output is becoming more of a technological reality in the office environment, many users are still holding out for higher resolutions and

a wider range of color at an affordable price.

"I don't think anybody argues that there is a need for color...but what's out there doesn't offer high enough resolution. [Ideally,] color output should be at least 600 dot/in. or more," says Simon Goldstein, assistant vice president in the personal resources department at Citicorp in New York. Goldstein's group uses Apple Macintoshes and two HP printers—a Thinkjet and a Laserjet Series II—as well as an Apple Laserwriter Plus for everything from systems update bulletins and product plans to basic internal communications, including a newsletter.

"Color is not a real key issue for us right now. Even at 300 dpi/in., if you look at a color image you can see the red dot next to the blue dot, which makes purple. It will be a couple of years before software and any high-quality color output is available" to a general office, adds Kate Schwinghammer, manager of microcomputing at Crown Publishing, a division of Random House, Inc. in New York. Crown Publishing is generating internal track reports and some memos off of IBM Personal System/2s and 3270 PCs using a Laserjet II as well as a number of Panasonic and Epson dot matrix printers.

Industry observers agree that ink-jet technology will emerge as the standard solution to affordable color hard copy, at least at the low end of the printer spectrum.

HP's Paintjet, for example, boasts 18-megapixel color output to the desktop. However, the printer's graphics resolution is only 180 dot/in. and takes 3½ minutes to print a full-page of images, compared with the fraction of a minute generally needed to print black-and-white text. Other ink-jet printers can take up to four minutes to print a full page of color graphics. Some users in search of color bulk at such plodding print speeds.

"We looked at ink-jet printers but they were fairly slow, and we

years ago," points out Bruce Enix, chief engineer at Eastman Kodak Co. in Dayton, Ohio. "Color printing at the PC level will be driven by the acceptance of color copiers. Printing multiple copies won't go over in the office environment" because it is slow, he added.

But despite these problems, a look at sales projections during the next several years upholds the notion that color hard copy is on the upswing. In 1989, according to Infocolor, color devices will

Another development that may anchor the color printing market is Mead Imaging's Cycolor, which is a progression of microencapsulation based in carbonless paper. Cycolor film contains billions of microcapsules, called cythils, sensitive to color lights and intensity. After the film is exposed to colored light, the cythils sensitive to that particular color harden. The film is then pressed against a receiver sheet by pressure rollers, and the softer cythils burst, transfer-

an advantage in that it works with any printer.

Printer-specific processors focused at the Postscript market will also accelerate bit-map processing. Chips from National Semiconductor Corp., Cirrus Logic and Western Digital Corp. provide "a lot of on-board logic to facilitate rasterization and bitmaps (block pixel transfer)," says David Hudson, a BIS CAP industry analyst. Instructions added in hardware rather than software enhance processing speed.

"The most important development in the nonimpact area will be increasing the performance of Postscript printers, primarily from clones. Better processors (building on the foundation of the Wetek and Motorola, Inc. 68000 will lead to lower prices," says William Hall, senior product planner at Genicom, Inc.

The upcoming release of HP's Printer Control Language (PCL), which offers page composition functions but lacks Postscript's inherent intelligence, will add font-rendering capabilities to PCL, bringing it a step closer to Postscript.

Fast compatibility has long been an issue in the Postscript clone market, but Hall does not see it as a major obstacle unless users want to add fonts to the set provided with a Postscript clone.

"If users want only Adobe fonts, then that's a problem, but the 35 fonts that most clones provide are enough," he says.

Standard setting

The industry must error fast compatibility may be settled by Microsoft Corp.'s selection of one specific vendor's page description language technology for IBM's OS/2 Presentation Manager, an announcement that is expected to be made this June.

"Everyone is trying to get Microsoft to settle on their own font technology. The Macintosh world has settled on Adobe, as has Unix. Whatever gets plugged into Presentation Manager will dominate the PC world and become a standard. Microsoft has said, 'Yes, we're going to pick someone, but it has to be an open language'—something printer companies can live with," QMS Parker explains.

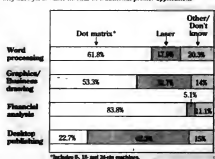
A recurring concern voiced by users is a desire for more memory, particularly for storing fonts. "We put 2M bytes of expanded memory in the Laserjet II, and most of the fonts still have to be loaded through software. We'd love to see more fonts and memory offered standard," says Jamie Schneider, a systems analyst at Banker's Trust in New York.

Most laser printers offer 512K bytes of standard memory. However, most users seek out more in the range of 2M bytes for font storage and enhanced processing speed.

"One thing we're finding with

All talk, no action?

Laser printers may owe the newer desktop publishing market, but they have yet to make inroads in traditional printer applications.



SOURCE: INTERNATIONAL DATA CORP.

PC SOURCE: ANALYST

account for 10% of ink-jet printer sales, 18% of thermal transfer printer sales and 21% of serial dot matrix printer sales.

Looking ahead to 1992, Infocolor estimates color printers will make up 15% of the ink-jet installed base, 23% of the thermal transfer installed base, and 31% of the serial dot matrix printer base.

While pricing a limited number of color pages has proven viable with ink-jet and thermal transfer technologies, affordable color laser printers are barely visible on the horizon. Although lasers are not out of the running in the color printing derby, users will most likely have to settle for no more than two- or three-color images.

"There is the possibility of having two stations to produce two colors on letterhead, but the real push is to do it all on a single photo-receptor with two or three toner baths. There's a lot going on in Japan right now with that. They're creating drums with three charge levels, but we won't see them [in the U.S.] for three years or so," according to Peter Steiner, president of Office Automation Systems, Inc. in San Diego.

The three-toner station method is expensive and causes more paper jams, but it is being refined for a push into the market in several years, according to other industry watchers.

ring the dye.

Because of the costly components required in a color laser printer, the Cycolor's paper-based technology of appears to be more attractive to printer users. "I think something like Cycolor makes a lot more sense than color lasers," says Harry Shapiro, a programmer/analyst with the graphic and print communications group at Sherron Lehman Hudson, Inc., a division of American Express Co. in New York. Using a Macintosh II and Dataproducts and Linotype printers, Shapiro's group produces weekly and monthly commodity reports for the company's financial consultants.

The big news in the Postscript market is that clones are finally shipping. Software-based host-resident Postscript clone controllers with a dedicated processor, such as products manufactured by Conographic Corp. and Destiny Technology Corp., and printer-resident clones offered by Quinc Corp. and Newgen Systems Corp. are making a splash simply because they are available to end users after a long period of anticipation, according to Naomi Cameron, associate director of research at BIS CAP (formerly Data Information Services) in Waltham, Mass.

Computer Automation International, Inc.'s Freedom of Press clone Postscript clone is in a slightly different category because the host processor handles the image rasterization. What it is slower than a hardware-based product, Freedom of Press has

EVEN THOUGH color output is becoming more of a technological reality in the office environment, many users are still holding out for higher resolutions and a wider range of color at an affordable price.

were't pleased with the color quality," says Glen Raines, senior resource analyst at Federal Express Corp. in Memphis. Raines' operation prints "mainly overheads" with graphics and bulleted items on a Laserjet II. The company is beginning to explore its color options for enhancing presentation material.

"Although color printing is a gaining ground, it's not at the stage that lasers were at a few

fonts becoming available in floppy disks is that memory is a key issue. It has been addressed, but not a great deal yet. Some printers have built-in hard disks for storing fonts," says Michael Kleas, president of Publishing Solutions, Inc., a desktop publishing consulting firm in New York.

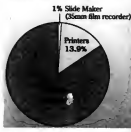
"I doubt many laser printers are shipped with less than 1M byte of memory, and most users bring it up to 2M bytes," says Ed Pullen, director of printer market research at Infocore in Santa Clara, Calif. Some printer manufacturers may begin to add either 500K or 1M bytes of static random-access memory at a slightly lower price than dynamic RAM and build on that, he adds. The inherent problem with storing fonts on hard disk is the lengthy access time. More on-board memory would provide a speedier option to enhanced font capabilities.

Control issues

Until recently, the controller, which creates the bit map to print out the image, resided in the printer itself. But Ricoh Corp. and other manufacturers have introduced the so-called "dumb" printer: The printer controller resides in the PC or other host

Color my world

While almost half of respondents say they are using a color output device, few indicate printers as their device of choice for color



SOURCE: INTERNATIONAL DATA CORP.

FW CHART: TOSHIBA JAPAN

system, and data travels via a video cable through a video port to the printer.

The industry is debating the virtue of host-resident controllers, but the trend has obvious advantages. Because the controller uses the host's power supply, cost is tempered. Users may also store more fonts on the hard disk in the host computer, BIS CAP's Cameron says.

On the downside, the controller ties up a valuable expansion slot. Also, Postscript use is currently most heavily concentrated in the Macintosh market, and there are no Mac-compatible host-resident Postscript controllers available. "Clumsy" keeps popping up in user feedback on the controllers as well, Cameron adds.

Pullen says the biggest breakthrough host-resident controllers offer is flexibility. "The advantage to this type of setup is that VAs or users can add more memory to speed processing or add fontware independently of the printer," he explains.

Other market watchers view host-resident controllers with less enthusiasm. While conceding that it is an interesting technological approach, some analysts indicate that the sheer number of printer controllers on the market may intimidate users. "Users might be confused. There are about 40 controller choices, although not every dealer would offer all of them. And there are newer engines out there [than the Ricoh engines]," Cameron says.

The real breakthrough, according to

THE INHERENT problem with storing fonts on hard disk is the lengthy access time. More on-board memory would provide a speedier option to enhanced font capabilities.

Pullen, will be a controller that resides in the printer, but acts independently of the host. "Users could put one in a plotter or Postscript printer and get it from any number of workstations without dedicating a PC to it," he says.

A more complicated type of controller for graphics data, the Raster Image Processor (RIP)-type interfaces, have proven to be robust graphics command accelera-

tors. However, many analysts say standard printer controllers residing in the host system are actually inherently slower, even though data is theoretically transferred to the printer at the host's bus speed. Some analysts also say that users will wonder whom to contact in the event of a technical mishap.

Host-resident Postscript or compatible controllers that act as a RIP (as op-

posed to a basic printer controller) have proven to be valuable tools when it comes time to process page description data.

"I like the RIP technology in terms of speed. With [Adobe] Display Postscript and [Microsoft's] GDI coming out, the external RIP-type controllers will be a good performance solution," Shearson Lehman's Shapiro says.

Vendors are jockeying for the lead in a fiercely competitive industry marked by an array of printing technologies, print speeds and product prices. Industry watchers and participants foresee a continuation of still-evolving market trends and the birth of several others over the next few years, all of which will streamline the process of outputting words and images on paper and other media. ■

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Dull, but death-defying

BY JOEL N. ORR

Pen plotters are the workhorses of the graphical output market and, as any farmer will attest, such animals have long, productive lives.

Analysts have been predicting the demise of the pen plotter for more than five years, but, while not showing any great growth, the market has refused to yield to

their predictions. Year in and year out, pen plotters continue to provide clear, concise graphical renderings to a small but stable market. Dan Mäler, a printer market analyst at Dataquest, Inc., reports that the overall pen plotter market for 1988 was 272,500 units — a 12% gain over 1987. This year, he says, no real gain is expected, but unit shipments will remain steady at the 1988 level.

Pen plotters are complex electromechanical devices that move a pen and a

piece of drafting medium relative to each other. They were the first graphical hard-copy output devices; an analog version called a chart recorder was first used in the 1940s. Digital pen plotters were popularized in the 1950s.

The largest group of pen plotters is the tabletop units, which produce color overhead transparencies in relatively small quantities for business presentations.

The large-format pen plotters — those capable of producing output 22 in. by 34 in. (D-size) or greater — are bought primarily by engineers and architects to use with their computer-aided design and drafting (CADD) systems. When CADD came to microcomputers in 1985, it started a period of unprecedented growth for the pen plotter market by reducing the

price of a CADD "seat" from \$100,000 to \$10,000 in a single year. With CADD systems so affordable, users needed output devices — and pen plotters were the only machines that could fit the bill.

Pen plotters often have multiple-pen holders that support drafting or roller-ball pens and felt- or fiber-tip markers of different colors and thicknesses. One Japanese firm, Mutoh Industries Ltd., offers a plotter that can use pencils as well as pens. These holders are sometimes mounted on the plotting head or on a non-moving part of the plotter. In the latter case, the pens are extracted and replaced by the moving plotter head.

The advantages of pen plotters over other graphical output devices are straightforward: Color and large formats are relatively inexpensive, and lines are smooth. On the other hand, they are slow and cannot operate unattended.

Life has become simpler and faster for pen plotter users since the early drum and flatbed devices. For instance, the base of the pen plotter has always been the pro-

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pensity of the pens to dry out without warming. Various devices, such as automatic capping mechanisms and sophisticated sensors, now keep the pens from drying out and inform the operator when it is time to change pens.

To speed up plots, some plotters offer optimizer buffers. These buffers store digital memory for holding the plot file, which frees the computer for other work. A typical D-size engineering drawing might take 30 minutes to plot but only two minutes to transfer into a buffer.

Optimization can be built into firmware, which sorts the plot commands to minimize the total motion and the number of pen changes required. Some CADD packages also provide plotter optimization software. Rearranging the plot order of the lines by means of these programs can save as much as 40% of the plot time.

Five years ago, the cheapest production D-size plotters cost \$10,000 or more. Today, the most popular units — from Hewlett-Packard Co., Calcomp, Inc. and Houston Instrument, Co. — are priced around \$5,000; low-end models are available for less than \$2,500.

Photoplotters, a variation on the pen plotter theme, use a beam of light to "draw" on photographic film in a dark chamber. Typically slow, precise and expensive, these machines create masks that are used in manufacturing printed circuit boards and integrated circuits.

The ability of the moving plotter head to carry something other than a pen has been utilized in a number of interesting applications. Gerber Scientific Instruments Co., a pioneer in the plotter business, makes plotters that cut out vinyl letters with a knife for signmakers; it also makes units that cut multiple layers of cloth with a saber saw.

Connecting plotters to computer systems can be a challenge because there are

Continued on page 62

The right stuff for LANs

BY MICHAEL WEISS

A major difference exists between local-area network printers and printers that just happen to be located on a network. Right now, most of the printers operating on LANs are single-user devices that are being utilized on the network by default, because few printers on the market have been specifically designed for networked environments.

These is vice-president and senior analyst at Info-
vision, Inc. in Santa Clara, Calif.

Although users have been getting by up until now, the need for printers targeted specifically for network use is becoming more and more apparent. Printing in the personal computer LAN environment is currently one of the fastest-growing printer market niches in the U.S. Market research firm Infoetics, Inc. estimates that more than 700,000 printers will be installed on new PC LANs in 1989.

There are, of course, many areas in which the criteria for network printers

overlap those for single-user units. In some instances, however, characteristics that are desirable in any printer become much more critical in a product meant for network use.

Ease of use, for example, becomes more important because networks and network printer configurations are often difficult to install, troubleshoot and maintain.

Speed and work-load capability are particularly critical characteristics users look for. The fastest printers working on today's networks are based on the Motorola, Inc. 68020 chip or reduced instruction set computing architecture.

In order for it to be really effective, however, a network printer should actually be capable of working twice as fast as

these types of products.

Duty cycles are also a matter of concern in network use. A number of 15 pages/min. devices currently offered on the market offer 25,000 pages/month ratings. This volume should become standard.

Paper handling is another area in which network use dictates more ambitious design. With more and more people using the printer, it is even more important to satisfy their varied requirements for both input and output. Users are currently asking for a minimum of two paper trays, each with a 200- to 500-page capacity, and they will probably want more next year.

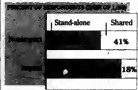
Beyond the familiar

However, network printer requirements go beyond these similarities. Today's printers must offer sufficient functionality and enough intelligence to support multi-user requirements.

As print servers, network printers re-

Share and share alike?

Nonimpact PC printers are shared more often than impact models. Lasers in particular are shared at more than half of surveyed sites.



Source: Information Systems Group, Inc. (ISG) Survey, 1988

quire intelligence adequate for functions such as queuing, printer recovery, error messaging and centralized spooling as well as bidirectional communications and error messaging.

In addition, they need to be compatible with network operating systems, imaging models and communications protocols within a wide variety of network environments.

Bidirectional communications between the printer and the computers on the network is especially important. PC LAN users should be able to monitor the status of the printer and check on their print jobs without having to leave their computers.

In the future, users should have the capability to read the status of the printer on a control panel and also receive bidirectional communications from the printer to the screens of the stations on the network.

Other features and functions that are important to a significant number of LAN users include queue manipulation, forms and font handling and individualized format settings.

Most of these functions are not yet available in desktop-type printers, and few can be purchased for less than \$10,000. As a consequence, network users either have to do without or settle for a software-based solution. Some third-party application and utility software and network operating systems can handle some of these tasks.

Neither route represents an ideal solution or one that will suffice for long. The future of network printers will be spurred on not only by user needs but by the growing sophistication of the networks themselves. ■



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Laser printers: 10 page/min and up

COMPANY	PRODUCT	DIMENSIONS (INCHES)	ENGINE	PRINT SPEED (PPM: MIN/AUTO)	DUTY CYCLE (PPM PER MONTH)	ASCENDING-ROUNDER MEMORY (KB)	RESOLUTION (DOT PER INCH)	EMULATIONS	FILE FORMATS (LANGUAGES SUPPORTED)	NUMBER OF HARDWARE FONTS/CHARACTER SUPPORT FOR SOFTWARE FONTS	NUMBER OF FONTS PER PAGE	RESIDENT RAM FOR FORMS	MAXIMUM INPUT SHEET CAPACITY	COLLATING	ENVELOPES/LABELS	FORMS LINES (40)	MOST TYPICAL USE	PRICE
Advent Technology International (408) 943-1730	LC-600	14 x 17 x 3.4	DesignJet 2000	80	100,000	6	300 x 300	Circle 600, Super PS-AL, PCL, HP LaserJet, PostScript, TeX, etc.	Proprietary	44/Ten	1	Yes	300	Optional	Labels	30	High-speed printing	\$94,900
	3070C-1	14 x 17 x 3.4	DesignJet 2000	30	100,000	16MB	300 x 300	Circle 600, Super PS-AL, PCL, HP LaserJet, PostScript, TeX, etc.	HP	9/Ten	1	Yes	300	Optional	Labels	30	Other applications	\$17,900
	3070C-1	14 x 17 x 3.4	DesignJet 2000	80	100,000	2	300 x 300	Circle 600, Super PCL, HP LaserJet, PostScript, TeX, etc.	Proprietary	10/Ten	12	Yes	300	Optional	Labels	30	Other applications	\$17,900
	3070C-2	14 x 17 x 3.4	DesignJet 2000	80	100,000	2	300 x 300	Verbatim 7-40	None	10	10	10	10	10	10	10	Other applications	\$17,900
	1070C-2	14 x 17 x 3.4	Book LP120	14	15,000	16MB-1.2M	300 x 300	Circle 600, Super PCL, HP LaserJet, PostScript, TeX, etc.	Proprietary	9/Ten	1	Yes	300	Optional	Labels	30	Other applications	\$8,400
	1070C-3	14 x 17 x 3.4	Book LP120	14	15,000	2	300 x 300	Circle 600, Super PCL, HP LaserJet, PostScript, TeX, etc.	Proprietary	9/Ten	1	Yes	300	Optional	Labels	30	Other applications	\$7,900
Aglis Corp., Computer Graphics Division (508) 658-0000	PS-100	44 x 30 x 21	HP	10	10,000-100,000	6	400 x 400	Circle 600	Postscript	12/Ten	1	No	2,000	Yes	No	30	Office and business publishing	\$18,900
	PS-100	14.5 x 20.5 x 20.5	HP	12	37,000	4	400 x 400	Circle 600	Postscript	12/Ten	1	No	500	Yes	No	30	Office and business publishing	\$12,500
	Computer Graphics 6300	18.5 x 25.5 x 25.5	HP	30	30,000	HP	300 x 300	HP	Proprietary	1,700/Ten	1	No	200	Yes	No	37	Other applications	\$17,500
Apollo Computer, Inc. (603) 286-0000 SOL Technology Corp. (603) 997-7365	Apollo Computer Laser 30	18.5 x 25.5 x 25.5	DesignJet 1200	30	60,000	5.2	600 x 600	Circle 600	Postscript	12/Ten	1	Yes	750	Yes	Both	30	Third processing	\$25,000-27,000
	Model 1	12.5 x 16.5 x 14	DesignJet 1200	12	35,000	2.5-6	300 x 300	HP LaserJet, Super PS-AL, PCL, HP LaserJet, PostScript, TeX, etc.	Proprietary	20/Ten	1	Yes	750	Yes	Both	30	CAD/CAM	\$3,495-54,995
	Model 2	14.5 x 20.5 x 20.5	DesignJet 2000	30	60,000-100,000	2.5-6	300 x 300	HP LaserJet, Super PS-AL, PCL, HP LaserJet, PostScript, TeX, etc.	None	20/Ten	1	Yes	2,000	Yes	Labels	30	CAD/CAM	\$8,995-17,495
	Model 3	HP	DesignJet 2000	30	60,000-100,000	30	300 x 300	HP LaserJet, Super PS-AL, PCL, HP LaserJet, PostScript, TeX, etc.	Proprietary	20/Ten	1	Yes	2,000	Yes	Labels	30	CAD/CAM	\$15,995
Bell Worldwide Information Systems, Inc. (617) 688-0000	Model 30	16.5 x 20.5 x 20.5	Book LP120	30	15,000	5.2	600 x 600	HP LaserJet, Super PS-AL, PCL, HP LaserJet, PostScript, TeX, etc.	None	4/Ten	20	No	500	Yes	Labels	30	Other applications	\$6,995
	LP70	11.5 x 16.5 x 16.5	Telex LP70	16	15,000	10/25	300 x 300	HP LaserJet, Super PS-AL, PCL, HP LaserJet, PostScript, TeX, etc.	HP, LPL, LPL	17/Ten	10-1	No	250	Yes	No	30	Text processing	\$2,545-54,430
C. Tech Computer Corp. (617) 237-0315 Fax: 445-0100	LP70	11.5 x 16.5 x 16.5	Telex LP70	16	15,000	10/25	300 x 300	HP LaserJet, Super PS-AL, PCL, HP LaserJet, PostScript, TeX, etc.	HP, LPL, LPL	17/Ten	10-1	No	250	Yes	No	30	Text processing	\$2,545-54,430
	CPT 7500	15.5 x 20.5 x 20.5	Postscript 7500	15	60,000	64MB	600 x 600	HP LaserJet, Super PS-AL, PCL, HP LaserJet, PostScript, TeX, etc.	HP	9/Ten	10	HP	600	No	Both	30	High-speed printing	\$2,995
CPT Corp. (617) 997-0000	CPT 7500	15.5 x 20.5 x 20.5	Postscript 7500	15	60,000	64MB	600 x 600	HP LaserJet, Super PS-AL, PCL, HP LaserJet, PostScript, TeX, etc.	HP	9/Ten	10	HP	600	No	Both	30	CPT Image file format	\$7,995
	L20 1200	15.5 x 20.5 x 20.5	Telex A700	12	25,000	4	600 x 600	HP LaserJet, Super PS-AL, PCL, HP LaserJet, PostScript, TeX, etc.	Postscript	20/Ten	1	Yes	250	No	Both	30	Desktop publishing	\$7,995
DesignJet Corp. (617) 997-0000	L20 1200	15.5 x 20.5 x 20.5	Telex A700	12	25,000	2.5	300 x 300	HP	Postscript	12/Ten	1	Yes	300	Yes	Labels	40	Tablet output	\$15,700
	L20 1200	15.5 x 20.5 x 20.5	Telex A700	12	25,000	1.2	300 x 300	9-Dot Line printer	HP	4/Ten	1	No	300	No	Labels	30	For on-line printing	\$24,500
L20 1200	L20 1200	15.5 x 20.5 x 20.5	Telex A700	12	185,000	100	300 x 300	Circle 600	HP	6/Ten	1	No	300	No	Labels	30	Legal file format	\$15,000
	L20 1200	15.5 x 20.5 x 20.5	Telex A700	12	60,000	3	300 x 300	HP	Express	2/Ten	1	No	300	No	Labels	30	Internal software support	\$20,995
L20 1200	L20 1200	15.5 x 20.5 x 20.5	Telex A700	12	185,000	3	300 x 300	HP LaserJet 2000	HP	16/Ten	30	Yes	1,500	HP	Labels	30	Network support	\$14,995

*— Limited by memory only

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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PRODUCT SPOTLIGHT

[illegible]

COMPANY	PRODUCT	EMULATIONS (DPI)	ENGINE	PRINT SPEED (PPM PER MINUTE)	PRINT CYCLE (MIN PER MONTH)	AMOUNT ON-BOARD MEMORY (KIB/MB/1TB)	RESOLUTION (DOT PER INCH)	EMULATIONS	PLUG IN DESCRIPTION (LANGUAGES SUPPORTED)	NUMBER OF HANDWRITING FONTS / OTHERS SUPPORTED FOR SOFTWARE FONTS	NUMBER OF FONTS PER PAGE	RESIDENT PACKAGES FOR FORMS	MAXIMUM INPUT SHEET CAPACITY	COLLATING	ENVELOPES/LABELS	MODELS (R/R)	MOST TYPICAL USE	PRICE
Dahlgren Corp. (608) 434-3970	AP-9130	300	Sheet	28	40,000	1	300 x 300	Dahlgren-ESL, EP, LaserJet Plus, IBM Proprinter, Epson	Express	24/Ten	Software dependent	10	300	Yes	Labels	25	Departmental computing	\$13,500
	AP-9115	300	Sheet	15	20,000	3	300 x 300	Dahlgren-ESL, EP, LaserJet Plus, IBM Proprinter	Proprinter	30/Ten	Software dependent	10	300	Yes	Labels	25	Desktop publishing	\$8,995
Vanguard, Inc. (301) 587-0000	V7500	18.5 x 23.4 x 21.1	Proprietary	3-10	3,000	6-12	600 x 600	Proprinter	Proprinter	10/Ten	10	100	Yes	Labels	60	Publishing	\$16,995-\$22,995	
	S2-1160	17.5 x 23.4 x 21.1	Proprietary	30	60,000	10	1,016 x 1,016	Proprinter	Proprinter, Corel, LaserJet	10	10	10	250	Yes	Labels	10	Publishing	10
Wang Laboratories, Inc. (603) 650-0000	LC310	18.4 x 23.4 x 18.4	Sheet (Laser)	15	25,000	3	300 x 300	Dahlgren-ESL	Proprinter	30/Ten	*	No	500	Yes	No	35	Text, image and graphics printing	\$8,495-\$11,900
	L25-24	28.5 x 42.5 x 27	Sheet (Laser)	24	40,000	2.5	300 x 300	None	Proprietary	None/Ten	*	No	2,000	Yes	No	35	Text, image and graphics printing	\$8,495
Sams Corp. (312) 333-5151	2700	46.5 x 29.5 x 29.5	Proprietary	24	30,000-40,000	10-50	300 x 300	10	Interprete	2/Ten	16	10	3,000	No	Labels	10	Departmental publishing	\$29,995
	2700-2	36 x 26 x 26	Proprietary	12	15,000	256K	300 x 300	10	Interprete	2/Ten	16	10	500	No	No	10	Desktop publishing	\$14,425
4001 Lines CY Month (214) 750-100	4001	18.5 x 27.5 x 11.5	Proprietary	10	4,000-20,000	1-4	300 x 300	Dahlgren-ESL, EP, LaserJet Plus, IBM Proprinter, IBM 3270, IBM 4330	Interprete	2/Ten	128	No	750	No	Both	10	Text processing	\$4,995-\$9,495
	4002	30"	Proprietary	30	800-800	512K	300 x 300	IBM 3271/3281	Interprete	2/Ten	96	10	2,500	Yes	Labels	10	Desktop publishing	\$16,000
4002	4002	41 x 28 x 18.5	Proprietary	30	100-100	512K	300 x 600	IBM 3271	Interprete	2/Ten	128	Yes	1,500	Yes	Labels	10	Desktop publishing	From \$17,000
	4003	41 x 28 x 18.5	Proprietary	75	200,000	128K	300 x 300	10	Interprete	2/Ten	26	10	3,000	Yes	Labels	10	Publishing	\$200,035
4003	4003	41 x 28 x 18.5	Proprietary	80	500,000	1	300 x 300	IBM 3271	Interprete	2/Ten	128	Yes	1,500	Yes	Labels	10	High-quality forms	From \$190,000
	4004	41 x 28 x 18.5	Proprietary	120	500,000	128K	300 x 300	10	Interprete	2/Ten	26	10	3,000	Yes	Both	10	High-quality forms	From \$190,035
Sams Corp. (312) 333-5151	SP-1100	18.5 x 27.5 x 11.5	Page	18	90,000	1-3	300 x 300	IBM 3271, 3811	SP/Ten	16	10	1,200	Yes	Labels	20	Electronic forms processing	\$11,900	
	SP-1100	18.5 x 27.5 x 11.5	Page	18	90,000	1-3	300 x 300	IBM 3271, 3811	SP/Ten	16	10	1,200	Yes	Labels	20	Electronic forms processing	\$11,900	
SP-1100	SP-1100	18.5 x 27.5 x 11.5	Page	18	90,000	1-3	300 x 300	IBM 3271, 3811	SP/Ten	16	10	1,200	Yes	Labels	20	Electronic forms processing	\$11,900	
	SP-1100	18.5 x 27.5 x 11.5	Page	18	90,000	1-3	300 x 300	IBM 3271, 3811	SP/Ten	16	10	1,200	Yes	Labels	20	Electronic forms processing	\$11,900	

Plotters

FROM PAGE 54

so many possibilities. Some plotters can be connected to networks and shared by a number of users, usually with a separate interface device that performs plot queuing and buffering functions.

This introduces certain administrative complexities. For instance, who controls the plot queue? Who changes the pens and cleans them? Who changes the paper? But these problems can be overcome, enabling users to justify the purchase of expensive, high-speed plotters.

Standard ways to communicate with plotters have come from the most successful plotter vendors. The most popular interface protocol is HPGL, a graphics language developed by Hewlett-Packard that is supported by all the leading graphics application programs.

Pen plotters offer sharp lines, color and a variety of media at low cost. But compared with electrostatic plotters or laser plotters, they are slow, especially

for operations such as hatching or filling. Also, unlike lasers, pen plotters cannot produce graded shades and must be monitored during their operation.

Best buy

Pen plotters are currently the most expensive, large-format color output devices available for CADD. But they face a challenge in this area from color thermal transfer printers, which are decreasing in price and increasing in format size.

For desktop graphics applications, pen plotters are still an alternative; units are available for as little as \$1,200, compared with \$4,000 for a 300-dot/in. color thermal transfer plot printer. However, innovations from the ink-jet market pose a serious threat to desktop plotters.

The plotter faces an uncertain future, threatened by the emergence of faster, more reliable and less expensive output technologies. But due to the loyalty of a small cadre of users, the final chapter on plotters will not be written for at least another decade—if then. ■

Creativity

FROM PAGE 55

graphics much beyond forms.

"I don't see people using high-speed printers for sophisticated output except for forms," says Gary Boyd, manager of printer research at International Data Corp. in Framingham, Mass. Vendors are not convinced that, however, and they are expending considerable effort developing printers "with higher resolution, better graphics software control and processing and color."

Xerox is leading the trend toward increased resolution with an expected 600 dot/in. model this year, and other manufacturers are following suit. Typically, high-volume printers offer 240 to 300 dot/in.

IBM is pushing its Advanced Function Software (AFP) printer control software, and other vendors are preparing machines compatible with AFP. Other developments, such as IBM's Intelligent Printer Data Stream, will push graphics processing down

to the printer from mainframes.

Color is one advance that many users are anxiously awaiting. "We're very interested in color," says Cliff Dodd, vice-president of billing and payment service at American Express. Dodd, whose objective is to make the charge statement as understandable and pleasing to the eye as possible, sees color as a desirable tool for that purpose.

Alternatives popping up

Although laser technology is on the rise in the high-volume market, newer technologies are popping up with promises of equal quality and higher reliability at lower cost. Right now, LED, ion deposition and magnetography are the major alternatives.

LED is an electrophotographic technology similar to laser printing. Unlike laser printing, LED machines are not based on copper technology, a primary source of the laser's reliability problems, IDC's Boyd says.

Ion deposition printing, developed by Delphix Systems, Inc., uses pressure to transfer the image to the paper. Although

less costly and less fragile than lasers, ion deposition has one major drawback, Boyd says—the transfer technique gives documents an unpleasant sheen.

Magnetography, developed by Bell Peripherals Corp., uses thousands of electromagnetic heads on the print drum to reproduce an image. Although a stronger contender on the basis of cost and capability, magnetography has been slow to catch on. "It is practically nonexistent in this market," Boyd says. (See story page 55 about one organization that has decided to take a chance on magnetography.)

In fact, all the alternatives are still too new and unproven to attract more than passing interest from the majority of high-volume printer users. Because of the difficulty in getting high-volume printers to interface with existing systems and the investment in software development to make the graphics work, users are extremely loyal to their existing technology. At least for the next few seasons, lasers will be the vehicle of choice for high-volume users. ■

IN DEPTH

An old idea gets a new twist

High-end graphics plus supercomputer power boost interactive technology

BY DAVE EVANS

It's amusing to recall that in the early days of computer behemoths, thinking people estimated that the total number of computing machines the world would ever need was about six. Clearly this projection did not hold up very well. Most estimates of the number of computers in use today run at somewhere around 80 million.

Certain ideas from these formative years have stood the test of time, however. The concept of interactive computing — the ability of humans to guide and participate in the computer-based problem-solving process — was the vision of the earliest architects of computer science. Even Charles Babbage provided a rudimentary form of interactivity in his earliest design by allowing for an alarm to ring at various intervals, signifying an opportunity for human input.

But despite the early recognition of the need for humans to monitor and interact with their computer tools during the course of problem solving, technical barriers prevented the realization of this vision. Even today, the world's most powerful supercomputers do not allow true human-machine interaction because of their "batch" orientation; they are incapable of accepting input until after the computation has been completed.

Evans is co-founder and chairman of Evans and Sutherland Computer Corp., a designer and builder of advanced graphics, modeling and simulation products based in Salt Lake City.

While, so-called "superworkstations" are touted as interactive machines, they do not have nearly enough computational horsepower to deal with the kinds of complex problems facing today's scientists and engineers. Thus, existing computing platforms have been rendered cumbersome, if invaluable, allies in the scientific and technical problem-solving process.

Recently, however, advancements in two areas — computer graphics and supercomputing technology — have challenged the barriers to truly interactive computing. Powered by newly available computational resources, the new class of supercomputers holds a promise similar to that of such problem-solving tools as the scanning

electron microscope or the telescope at their inception.

Consider the following example, which helps illustrate the significance of this technology convergence: Imagine a major U.S. car manufacturer putting a sports car prototype through its paces. A torrential rain offers the perfect conditions under which to test the braking capabilities of this high-performance vehicle. The car careens around a curve, and the brakes are slammed to the floorboards. But the wet brakes do not respond as quickly as had been expected.

The car goes into a dangerous skid, hits a retaining wall, and tumbles end over end.

Miraculously, however, the car remains intact, and another prototype, with a modified brake

system, is instantly readied to try the course again. The reason? The test drive has been conducted on an interactive supercomputer. In fact, there is no car, no driver and no test course; only a powerful supercomputer, a sophisticated graphics system and a mechanical engineer with the heart of a race car driver. This is not simple computer-generated animation such as that seen in television commercials. This scenario portends actual processing providing more realistic results.

Breaking reality barriers

Interactive computing represents the synthesis of a diverse body of work in computer science. It relies on developments in graphics and supercomputing



JOY PHILLIPS

- Megabandwidth connectivity required
- Moderate parallelism the way to go
- Simulating an experimental world

and also on the blending of these two disciplines: graphics, to provide the visual link between the human and the computer, and supercomputing technology, to power this compute-intensive interaction.

In many ways, the advantages of this synthesis are far greater than the individual benefits of either of its key elements. Take another example, this time from the field of molecular modeling. A scientist trying to determine the configuration of a genetically altered molecule can use a sophisticated graphics package to produce three-dimensional drawings of the possible configurations. But to test the accuracy of these configurations, he needs far

rotate the molecule on all axes, apply varying forces and test each molecule's integrity under conditions that would be impractical to simulate in any other way. With enough power, he can add the dimensions of time and space to his computer images, performing experiments currently impossible in the laboratory.

This is perhaps the most compelling benefit of this new breed of interactive computers: They may allow scientists and engineers to break the traditional barriers of reality and simulate an experimental world entirely under their control.

Ironically, as much as this new breed of computing depends on visualization, it is

This is where existing supercomputers fall short. Because the designers of the original supercomputers did not foresee the ultimate need for converging graphics and compute power, they did not build their machines with interactivity and visualization in mind. Instead they chose an architecture, based on vector processing, designed to speed computation in highly specialized, batch-oriented number-crunching applications. Unfortunately, this architecture is incompatible with the effective execution of graphics.

Furthermore, computers based on vector architectures function efficiently only in a narrow range of extremely compute-intensive, noninteractive applications. Even in these applications, painstaking modifications in code — using a process called vectorization — are required if users are to achieve anything close to peak performance. These limitations have served to keep supercomputer performance in the hands of a few elite, high-performance users.

Rise of moderate parallelism

Recently, however, a new type of supercomputer architecture known as moderate parallelism — based on a moderate number (two to eight) of processors functioning in parallel — is being developed by some high-end supercomputer vendors and research laboratories. Moderate parallelism will help to overcome the problems associated with traditional vector-based or massively parallel supercomputers. Not only will this architecture broaden the range of supercomputer applications, but it will accommodate both visualization and interactivity. Moderate parallelism has the potential to allow users to achieve the supercomputer performance required for interactive, visually oriented applications without the need for major alterations in code.

Once these new computer architectures take hold — which may occur in the next two years — the only barrier to truly interactive supercomputing will be connectivity. Because generating graphics is so compute-intensive, a great deal of bandwidth is required to transmit graphics data between the user's workstation — where graphics are displayed and manipulated — and the supercomputer, where the actual calculations are performed.

One current solution to this problem is to provide substantial graphics processing power at the workstation level; thus, data can be "preprocessed" so that only essential information is sent over the limited data pipeline.

The long-term solution, however, involves the development of connectivity technologies more appropriate for interactive supercomputing. Such efforts are currently under way at Sandia National Laboratories in Albuquerque, N.M., Apple Computer, Inc. in Cupertino, Calif., and the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign, among others. These megahandwidth technologies will be economically feasible for the larger scientific, technical and commercial market in the next five years.

In the natural sciences, advanced interactive computers will offer researchers increased flexibility and freedom, par-

ticularly in fields such as meteorology or cosmology for which data is not laboratory. In these disciplines, scientists have been at the mercy of the atmosphere or the cosmos in conducting their experiments, with no control over the timing or the conditions of their research.

Through interactive computing, however, scientists can potentially simulate many experimental conditions, change variables and watch the results on their computer screens. Scientists will be able to witness the formation of phenomena from weather systems to galaxies on their computers. They will also be able to verify theories that were previously untestable, such as those concerning the birth of the universe or the death of stars.

In addition to freeing researchers from the typical constraints of laboratory conditions, interactive computers will release them — through the power of visualization — from the constraints on their own creativity. Scientists have long understood that the human mind solves problems by creating and manipulating images — visualizing the problem and imagining possible solutions.

By scanning a single image, the human mind can assess vast quantities of data, recognize complex patterns and intuitively understand their significance. It can form a picture of the next steps in the problem-solving process. It can manipulate images and move them through time and space, transforming them into completely new concepts. Its creative potential is unlimited.

Not so with traditional computers, whose output, especially in scientific and technical applications, has been limited to row after row of numbers or single, static images. When humans must adjust to these limitations, it is at the cost of creativity and intuition. Today many scientists spend at least as much time adapting their ideas to their computer tools as they do thinking about the ideas themselves.

The new generation of interactive computers, however, may provide a better match for sophisticated human capabilities, allowing scientists to focus their energies where they belong: on the fundamental questions of their research. At the National Center for Supercomputing Applications, the potential of this new technology has sparked the creation of "teams" consisting of scientists, graphic artists and computer programmers. Each team member brings his own set of skills and knowledge to the conceptualization and subsequent visualization of particularly difficult scientific problems.

This new approach to scientific computing will envision entire fields of research, such as human anatomy, that have stagnated due to limited tools. The new computers have the potential to let anatomists simulate complex joint and muscle movements never before visualized and, therefore, never before fully understood. They may enable scientists to peer into the human anatomy with a clarity of vision never before possible, providing them with 3-D views from any vantage point.

Used to full potential, these new interactive supercomputing tools could open up whole new fields of inquiry, possibly providing answers to questions that we have not yet dared to ask. ■

THIS IS WHERE existing supercomputers fall short: Because the designers of the original supercomputers did not foresee the ultimate need for converging graphics and compute power, they did not build their machines with interactivity and visualization in mind.

more than graphics. He also requires the computer horsepower necessary to calculate the stress on each chemical bond, so that an accurate representation of each potential configuration can be created.

But the scientist need not stop here. If even greater graphics and compute power are applied, a giant leap in capabilities can also be achieved. The scientist can manipulate each image according to the physical laws that govern its molecular structure. He can try new configurations,

compute power, not graphics, that has been the chief barrier to its full realization. The 3-D graphics and solids modeling capabilities required for visualization are among the most compute-intensive tasks in computer science. The ability to further manipulate images requires even greater compute power, beyond that of even today's largest supercomputers.

But it also requires something else: a computer architecture that can facilitate the blending of both speed and graphics.

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Bridging the learning gap



"A little learning is a dangerous thing..."
Alexander Pope

With users clearly in the driver's seat of an industry marked by tear-away technological advances and breakpoint competition, access to an awe-inspiring amount of information is increasingly easy and cheap.

Great, right? Not always. The suggestion is beginning to surface that for some end users — sophisticated professionals in many cases, but new to the information-foundation game — the computer industry is serving up too much of a good thing.

Users of today's desktop or laptop computers, not to mention those who end up with encyclopedic information in the palms of their hands, are the privileged recipients of technology that thousands of develop-

Continued on page 68

Inside

- Informix enters the ranks of the profitable. Page 67.
- IBM tagged as California's alleged largest contributor to ozone depletion. Page 66.

A surviving Mentor

Hardware will remain, despite Apollo buyout

BY HELEN PIKE
OF STAFF

BEAVERTON, Ore. — Behind the headlines of Hewlett-Packard Co.'s plan to buy the financially struggling but technically sophisticated Apollo Computer, Inc. lies another story about another company: Mentor Graphics Corp.

The 8-year-old company is the leading supplier of engineering design software that runs almost exclusively on Apollo workstations. It reveals the 32-bit computers by bundling its applications for the electronic design

12% of the Massachusetts company's annual revenue. Last year, Mentor earned \$33.5 million on revenue of \$300 million.

For now, the HP acquisition signals that there will be continuing Apollo hardware for Mentor's varied customer base, which ranges from Next, Inc. to Honeywell, Inc.'s Marine Systems Division to NCR Corp.'s Personal Computer Division to Boeing Corp. Yet bobbing on the horizon is speculation of an alternative platform — HP's Precision architecture, which is expected to carry some amazing performance punch in the early 1990s.

No secrets here

"We made no secret that DEC, IBM, Sun and HP were trying to woo us to a second platform," said Gerry Langeier, president and chief operating officer at Mentor, about a process that in recent years also included interest by Apple Computer, Inc. for its Macintosh.

"We let it be known that if they wanted us, they should do something about Apollo," Langeier added about Mentor's desire to stick by Apollo's distributed processing and networking architecture. Apparently, "HP took us quite seriously and saw an opportunity there."

But HP's Apollo purchase does not mean Mentor will rush to diversify its products on another platform. "That assumes you burn so greater energy standing on two legs than on one. That's not true," Langeier said,

One car, one \$9.8M firm

A one-car garage is no big deal. You could say this one has done a bit better as a high-tech coliseum. Last week, the state of California dedicated the garage — where friends and partners David Packard (at left in both photos) and William Hewlett (today and, below, in 1939) launched Hewlett-Packard Co. — as a historic landmark and the birthplace of Silicon Valley.



characterizing the company's position as "wait and see."

Rather, Mentor is burning more energy on the Falcon Project, a \$100 million research and development effort undertaken

about three years ago to make its software tools less proprietary and more integrated by writing them in C++, the object-oriented programming language.

Continued on page 72

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IN BRIEF

Changing times

Milpitas, Calif.-based Systems Industries, Inc., announced a restructuring plan under which it will lay off 120 — 22% — of its North American employees, discontinue certain operations, consolidate facilities and try to ally with other corporations. Times have been rough lately for the maker of Digital Equipment Corp.-compatible data storage devices: Its most recent quarter brought a \$25.9 million loss and a patent infringement lawsuit from DEC.

Gimme five

Sematech, the Austin, Texas-based consortium of 14 computer industry companies and the Defense Advanced Research Projects Agency (DARPA) announced its first five joint research and development contracts last week. Joining the consortium in an effort to bolster U.S. semiconductor strength will be ATEQ in Beaverton, Ore.; GCA, an Andover, Mass.-based subsidiary of General Signal Corp.; Hewlett-Packard Co. in Palo Alto, Calif.; Westech in Phoenix; and a team of three gas companies.

In MIT's yard...

Consortiums are also in bloom at the northern end of the Austin-Boston axis. The Consortium for Superconducting Electronics, whose name tells it like it is, was launched last week by AT&T, IBM and MIT.

Go green

MicroAge, Inc., which was tapped earlier this year as one of two national dealer chains authorized to market and support AIX — IBM's flavor of Unix for the Personal System/2 — got another green light from the industry giant last week: authorization of 26 locations of subsidiary MicroAge Computer Stores, Inc. as AIX dealers.

Go West

Twenty-year IBM veteran Dennis W. Andrews — most recently head of strategy, plans and support at IBM's Advanced Workstation Division in Austin, Texas — will be the new vice-president of systems software at Koren Corp.'s development and manufacturing operations in Sunnyvale, Calif.

Trading places

Reuters Japan Ltd. and Sony Corp. are teaming up to develop a workstation tailored to handle both English and Japanese data and aimed at the financial community, the companies announced last week.

IBM called a polluter

BY J. A. SAVAGE
CW STAFF

SAN JOSE, Calif. — IBM was accused late last month of being the largest California contributor to the depletion of the Earth's ozone layer.

Members of Citizens for a Better Environment (CBE), based in San Francisco, massed at the company's storage-device manufacturing site here to demand that IBM phase out the use of ozone-depleting solvent during the next year.

An IBM spokesman said the company would decrease its chlorofluorocarbon

(CFC) emissions but provided no timetable for the promised action. The company agreed that CBE's count of its CFC emissions — 1.47 million pounds in California in 1987 — was correct. That number is three times the amount of the next highest polluter.

Pointing the finger

CBE found five computer companies among the top 25 emitters of the ozone-depleting chemical. Other polluters that were identified by the environmental group were Convergent, Inc., Hewlett-Packard Co., Seagate Technology Corp.

and Unisys Corp.

IBM maintains that it has reduced its California emissions to 640,000 pounds since 1987, the last year for which emissions figures are publicly available. That figure, however, is still nearly twice that of the next highest polluter, a laboratory. IBM said it uses 18 million pounds of CFCs annually worldwide.

CFCs are used as solvents to clean electronic parts, from semiconductors to circuit boards. The computer industry contributes from 20% to 30% of all CFC emissions worldwide.

Other sources are refrigerants, aerosols and blowing agents for foam products. Originally, the chemical was used widely because it is nontoxic to humans in direct contact.

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Informix captain rights ship, navigates back into the black

BY PATRICK WAJZYNIAK
OF WFO

MENLO PARK, Calif. — When former Wyse Technology President Phillip E. White started the year at Informix Software, Inc., the newly appointed chief executive officer's first goal was to bring the ailing database software maker back into the black.

And he did. Last year, Informix was buffeted by two successive quarterly

losses, a 15% reduction in its work force and delays in its new office automation products. In its first fiscal quarter, which ended April 1, however, the company turned a modest profit of \$481,000, compared with a loss of \$4.8 million in the same quarter last year. Revenue of \$31 million marked a 20% rise over fourth-quarter 1988.

"We're a \$100 million start-up that just had its first profitable quarter," quipped White, also a veteran of San Jose-

based Altos Computer Systems, Inc. and IBM.

To turn the corner, Informix reorganized its product development and marketing functions into two divisions. Last February, the company began shipments of its delayed Wings graphics spreadsheet for Apple Computer, Inc. Macintosh personal computers.

The new product is the first of several office automation products to come from Informix's 1988 merger with Innovative Software, Inc., an office automation firm based in Lenexa, Kansas. Traditionally oriented toward value-added resellers, Informix is

selling Wings through major software distributors and through retail chains such as Egghead Discount Software, Inc. and Businessland, Inc. stores.

White said the firm plans to integrate its office automation, relational database and tools products more tightly and will focus its office automation line on three platforms: the Macintosh; MS-DOS and OS/2; and Unix. The company, he said, is depending on Wings to open up the retail route and the desktop market for its office automation and database lines.

David G. Bayer, an analyst at Montgomery Securities, said that in his opinion, the jury is still out on the new Informix.

"They've shown a strong ability to keep up revenue, but our concern is that we've only seen one-quarter of benefits from the cost controls such as the layoff of staff," Bayer said.

"The QA market has been tough for them in the last eight months," he added.

"The problem is that they have been

WE'RE A \$100 million start-up that just had its first profitable quarter."

PHILLIP E. WHITE
INFORMIX SOFTWARE

merchandising a product, Wings, that they haven't been able to ship, and there's also been a significant slowdown in their Smartware line," Bayer said. Updated Smartware office automation products shipped earlier this month.

On the other hand, Informix's database business recently has seen robust growth, Bayer said, noting that that side of the business has been "carrying the company for some time."

Differentiation, Bayer said, has become an indispensable element in a hotly contested database market, where "the battle is being won on things other than technical quality."

Informix could get a boost in this key area, he said, if its plans to add object-oriented and image-handling capabilities to the database line later this year are successful.

John Larch, data systems specialist at the Oregon Department of Transportation in Salem, Ore., seemed unruffled by Informix's recent fiscal problems. Larch, who uses the Informix fourth-generation language and SQL database products to help automate the weighing of trucks on state highways, said he has not found an application in which the Informix products do not work.

"We find it suits our purposes to a T," Larch said of the Informix database, which automatically weighs and catalogs database information on each truck that passes through its scales.

Informix plans to offer a Wings spreadsheet on OS/2 Presentation Manager, on Unix platforms with the Open Look interface developed by Sun Microsystems, Inc. and on the Open Software Foundation's Motif graphical user interface for Unix. White said those versions, and potentially others for windowing environments like Nextstep, will be out before the end of calendar 1989.

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Margolis

CONTINUED FROM PAGE 65

ers have toiled to make accessible. Unfortunately, a lot less attention has been lavished on making the information understandable.

To put it bluntly, that's not computer vendors' business. They've taken care of the hardware and software; the brainware is supposed to be supplied elsewhere. In fact, it's supposed to be supplied by the education system and by common sense, neither one of which is enjoying a reputation for dependability.

That might be why you're beginning to hear stories such as these:

A noted litigation law firm in a major

East Coast commercial center implemented an automated docketing system. The custom software, according to the firm's information systems director, was designed to track each attorney's court cases, calendared appearances and required filings. Using information filed in a centralized database, the system could remind the lawyers of where they should be in a case, literally and figuratively, on a daily, weekly and monthly basis.

In this case, the users would have known what to do with the information once they got it. What they could not get their minds around, the IS director said, was the idea that they could not get it unless and until someone loaded and constantly updated the database. The minute the PCs were on partners' desks, the

IS director said, they assumed the information was in there. (It makes a certain amount of sense; after all, when you put a television in your bedroom, you don't have to input the actors and ads.) For the first time in firm history, lawyers began to miss court dates. Filing deadlines came and went, unheeded. When asked, the bewildered (and, before long, infuriated) attorneys said, "But I logged on yesterday, and the computer didn't say a thing about a reply due in the XYZ case on the 15th . . ." Today, the docketing system is history; so is the IS director.

Meanwhile, the IS director at one of the nation's leading insurance companies said that his development crew was in the final stages of perfecting the technology for issuing life insurance policies

from laptop computers. Soon, he said, agents from coast to coast will be able to take a prospect to lunch and, using a laptop-based software program communicating with the mainframe at company headquarters, have a policy issued before dessert.

The IS head confided, however, that he was planning to sit on the break-through technology for a while. His concern, he said, was the maturity problem. What, that the industry is mature? No, that the agents might not be. Armed with a barrage of information they might not fully understand, he said, "I'm concerned that some of them will get carried away with white-bang technology and vow the [clients] rather than serve them."

Cut to yet a third major metropolis, where the real estate market has slipped from unspeakably high to merely shocking. Earlier this month, local industry spokesmen attributed the slump to developers who are giving their clients the finger; that is, the finger applied to a pocket calculator.

The first and ultimate end-user computer, said one real estate firm executive, is putting Pope's "dangerous thing" at the fingertips of eager, ambitious developers who dazzle their clients — and maybe themselves — with a display of numerical proficiencies that has lots to do with pie in the sky and little grounding in the realities of reality.

Considering that we have yet to resolve the issue of whether it is guns or people with guns that kill people, maybe we're not ready to tackle the question of where the responsibility falls when a user with an itchy trigger finger gets hold of a loaded pocket calculator. But we probably ought to be aiming to try.

Margolis is *Computerworld's* senior editor. Industry.

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NICKELS & DIMES

Synoptics Communications, Inc. reported revenue of \$14.7 million and net income of \$1.9 million for the first quarter ended March 31. This compares with revenue of \$4.3 million and net income of \$555,000 for the same period last year.

Aldus Corp. announced revenue for the first quarter ended March 31 of \$23.9 million, a 50% increase from the \$15.9 million reported in the first quarter last year. Profits were \$4.3 million, up 38% from the \$3.1 million for the same period last year.

Sterling Software, Inc. reported revenue for the second quarter ended March 31 of \$45 million, compared with \$38.9 million in the previous year. Profits were \$2.5 million, compared with \$1.4 million a year ago.

Businessland, Inc. announced revenue for the third quarter ended March 31 of \$293.3 million, compared with \$251.5 million last year. Profits were \$8.5 million, compared with \$5.4 million in the like period a year ago.

Sungard Data Systems Inc. reported net income for the first quarter ended March 31 of \$3 million, compared with \$2.4 million a year ago. Revenue for the quarter was \$35.5 million, compared with \$28.3 million reported last year.

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Court: States may tax net traffic

WASHINGTON, D.C. — A U.S. Supreme Court ruling last week may mean that states can tax net traffic. The court ruled in favor of the states in a case involving a tax on interstate commerce. The ruling is expected to have a significant impact on the way states tax net traffic.



On SQL Server's test trail

A BOSTON GROUP OF THE U.S. ARMY CORPS OF ENGINEERS has selected a number of the U.S. ARMY CORPS OF ENGINEERS' SQL Server software for a test trail. The test trail is expected to last several months.

NAS deal brings new lineup to plug-compatible market

ATLANTA — A deal between the National Automatic Switching (NAS) and the plug-compatible market has been announced. The deal is expected to bring a new lineup of products to the market.

Chip prices drop; PC prices don't

IN THE MARKET FOR A NEW PC? If you are, you may be disappointed to learn that chip prices have dropped, but PC prices have not. This is due to a variety of factors, including the cost of components and the demand for PCs.

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*The Wall Street Journal (1987) — "Survey of the Information Processing Marketplace."
*The Adams Co. (1988) — "Information Systems Management Study."

COMPUTERWORLD

IBM changing sci/tech guard

BY NELL MARGOLIS
CHICAGO

ARMONK, N.Y. — IBM Vice-President and Director of Research John A. Armstrong will come to work Thursday as the company's new vice-president of Science and Technology, reporting to Chairman John F. Akers.

The longtime IBM veteran, whose accomplishments in physical science have also won him the George E. Pake Prize of

the American Physical Society and a 1988 presidential appointment to the National Advisory Committee on Semiconductors, replaces IBM Senior Vice-President Ralph E. Gomory, who will retire from both his post and the company this week and take on the mantle of president-designate of the Alfred P. Sloan Foundation.

In an interview last week, Armstrong said he planned to steer Science and Technology along the course set by Gomory when he took over its stewardship almost three years ago.

"As director of research, I've been part of Mr. Gomory's plan, and I think

we're on the right track," Armstrong said. "I'm convinced we've got a good thing going. I don't plan any major changes."

Under Armstrong, as under Gomory, Science and Technology will be "working to shorten development cycles and to facilitate the process of technology transfer," said the division's new leader.

Making a major step in that direction, Armstrong met with the president of Rensselaer Polytechnic Institute in Troy, N.Y., late last week to inaugurate an IBM/RPI joint program that will develop very advanced electronic packaging technology.



IBM's Armstrong will stay the course

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COMPUTERWORLD
PERSPECTIVES 1989

Acquired Apollo will retain a familiar look

BY MICHAEL ALEXANDER
CHICAGO

BOSTON — While it won't be business as usual, Apollo Computer, Inc. will not change dramatically now that it is part of Hewlett-Packard Co. That is the message executives of HP delivered at a press conference last week, held here to outline the steps that HP plans to take to integrate the two companies.

Although Apollo will become a division within HP's Workstation Group, its headquarters will remain in Chelmsford, Mass., and it will continue to manufacture and market its DN series workstations, according to HP.

David M. Peronek, a 16-year HP veteran, will take over as general manager of the newly established division. Peronek will replace former Apollo Chief Executive Officer Thomas A. Vandervelde, who left the company last week. Peronek will report to Bill Kay, general manager of HP's Sunnyvale, Calif.-based Workstation Group.

"It is important from our point of view that the new general manager be a Hewlett-Packard general manager," Kay said. Peronek is a "strong strategist" who will be responsible for bringing the resources of HP and Apollo together, he said.

Peronek will be responsible for the development, manufacturing, marketing and support of Apollo-made products. He most recently served as general manager of HP's Imaging and Obstetrical Care Division.

A newly formed interim merger/management organization will be charged with melding the people, processes and organizations of both companies into a unified business, an HP spokesman said. Brian Moore, general manager of HP's Computer Manufacturing and Planning Group, based in Cupertino, Calif., will head the merger organization.

HP does not plan to lay off any of Apollo's employees, Kay said. Those with duplicate functions will have the opportunity to move to other HP divisions, he said.

According to several of its executives, HP will fuse the two companies' research and product-design efforts for a new generation of systems based on the Motorola, Inc. 68040 microprocessor; it will also merge application software available for Apollo Domain/OS and HP-UX. HP's operating system based on AT&T's Unix System V Interface Definition Issue 2. HP will introduce a "major performance upgrade" for Apollo's DN10000 workstations and servers in November, said Mark Tolliver, marketing manager of HP's Workstation Group.

The company also said that it will move toward an Open Software Foundation (OSF)-compliant operating system and introduce its first OSF product next year.



HP's Peronek heads new unit

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Used computers to get a fair shake

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Computer dealers scored a major victory earlier this month when a federal appeals board put the U.S. General Services Administration (GSA) on notice that it must not discriminate against used computers in federal procurement policies.

Specifically, the GSA Board of Contract Appeals ruled that it was unreasonable for the GSA to exclude used computers from its multiple-award schedule, a list from which federal agencies can order information systems.

The ruling upheld protests lodged by two used-computer dealers, Insyst Corp. in Burke, Va., and National Computer Equipment Corp. in Troy, Mich. It was a victory for computer dealers as well as U.S. taxpayers, because used computers are generally less expensive than new ones, said a spokeswoman for the Computer Dealers & Lessors Association.

Acting purchasing agent

Under the GSA's multiple-award schedule program, the GSA acts as a purchasing agent for federal agencies and negotiates a government discount with approved vendors. For its fiscal 1990

schedule, the GSA excluded used computers on the grounds that spot market prices for used computers fluctuate too much for the GSA to determine whether commercial prices are reasonable.

However, Administrative Judge Robert W. Parker scoffed at that rationale as "grossly inadequate." Noting that there are several market indexes and "blue books" for used-computer prices, he said, "We have no doubt that, with a little effort, GSA could come up with a reasonable solution to the problem that it perceives."

Parker added that such efforts would prove worthwhile, since the lower prices for used computers mean that "the government can never lose money by including used equipment on the schedule."

Mentor

CONTINUED FROM PAGE 65

It is a smart move, according to one industry observer. "They are developing technology to address emerging markets," said Robert Herwick, an analyst at venture capital firm Hambrecht & Quist, Inc. in New York.

With the runaway lead in electronic design automation, Mentor is training its sights on the mechanical design market. Now, with an all-new C++ tool environment, Mentor can now more computer-aided software engineers.

Because all of this design activity generates more data, Mentor has uncovered a profit stream in document publishing. Its context division is an offshoot of the document management needs of its aerospace, engineering and manufacturing design customers.

Herwick attributed some of Mentor's success in the computer-aided design market to luck and its competitors' flawed strategies. In the 1980s, Mentor was led by a group of "young, ambitious men," he said about the original nine who left the computer-aided engineering firm Tektronix, Inc. in nearby Beaverton.

"With skill and luck, they picked the

At A Glance

Mentor Graphics

Established: 1981

President and COO: Gerard H. Langeler

Headquarters: Beaverton, Ore.

Software: Based on a user interface structure called "Ideality," includes text processing, window and database management

Hardware: Apollo workstations

Employees: Approximately 2,000 worldwide

1988
net revenue: \$300.8 million

1988
net income: \$33.8 million

1988 R&D: \$23.8 million

Falcon Project: A \$100 million project to develop a new generation of object-oriented design tools for the 1990s

Source: Business Week, June 1989

Source: Investor Relations

right strategies. But they were also naive. In 1985, they made their share of mistakes," he said. Among those errors was an accumulated software inventory that became obsolete as the electronics industry got mired in a downturn.

"Up until 1985, all we cared about was revenue growth," Langeler said. By learning how to manage assets, the firm improved its financial performance, pumping net income up from \$7.9 million in 1985 to \$33.5 million in 1988. Revenue shot up during that time from \$173.5 million in 1986 to \$300 million in 1988.

Although Langeler said the company will stay its course in the technical market, he said the trend to merge technologies across the historically large boundary between commercial and technical computing will continue.

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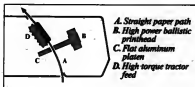
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"Computerworld is the future of our advertising... No other single source has produced so many qualified candidates for us."

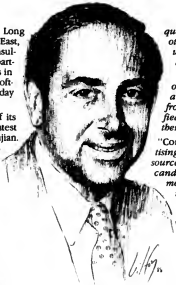
— John Tutunjian
Chairman
Cornell Computer Corp.

Cornell Computer Corp., based in Long Island, N.Y., with 15 offices in the East, West and Southwest, provides consultant services to the nation's MIS departments. The company also specializes in training seminars and courses and software maintenance on a 24-hours-a-day basis.

But Cornell considers the quality of its consultants to be the company's greatest asset, says Chairman John Tutunjian. That's why, he notes, when it comes to recruiting consultants, Cornell turns to *Computerworld's* Computer Careers pages.

"We recruit nationally. Our goal is to hire highly qualified people as a direct result of our ads. If we can hire just one consultant from an ad, we still save money over other methods, so naturally, we concentrate on print advertising.

And *Computerworld* is our primary vehicle. As I said, we recruit nationally and we target qualified personnel. Well, *Computerworld* gives us national exposure and puts us in touch with the most



qualified professionals. More than any other publication, *Computerworld* puts us in touch with the very people we're looking for.

"The results have been terrific. For us, one hire and the ad pays for itself — and we typically hire several people from a single ad. So we're finding qualified personnel and our ads are paying for themselves. Who could ask for more?"

"*Computerworld* is the future of our advertising, no question about it. No other single source has produced so many qualified candidates. Advertising in *Computerworld* means our message reaches key players in the computer market from coast to coast."

Computerworld. We're helping serious employers and qualified information systems, communications and PC professionals get together in the computer community. Every week. Just ask John Tutunjian. For all the facts on how *Computerworld* can put you in touch with qualified personnel, call John Corrigan, Recruitment Advertising Sales Director, at 800/343-6474 (in MA, 508/879-0700).



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COMPUTER CAREERS

Selecting a winning broker

The road to independent consulting can be fraught with sudden perils

BY JANET RUIH
SPECIAL TO PCW



Most information systems professionals striking out on the road to contract consulting rely on broker firms to find work for them. It is only those rare few who have mastered the art of working with such consulting firms, however, who go on to build a successful practice.

Working with a broker is no easy feat. Unlike a relationship with a headhunter, which has a defined end point, the relationship with a broker is an ongoing one. The consultant is paid by the broker, not the client, and the consultant's reputation, rightly or wrongly, rests squarely on the shoulders of the firm that represents him.

Once he places the consultant, the broker makes a significant amount of money for every hour that the consultant works—often 25% to 40% of every dollar that is billed to the client—although the broker's contribution may be limited after the initial contract.

Since their success depends on the quality of the representation, IS professionals who consider breaking into contract consulting should learn how to

choose the brokers with whom they will work. The following strategies have been used by successful consultants to maintain positive relationships with their brokers.

- **Make the nature of the relationship clear.** Many consulting companies, particularly the larger, well-known ones, maintain staffs of salaried consultants. These companies concentrate on placing their own salaried employees first and only place a contract consultant when a client has a need that no one on their staff can fill. Do not expect a broker to pay you a subcontractor's higher hourly rate unless you possess specialized skills that distinguish you from the firm's salaried employees.

Even if you do, many consulting firms insist that you go on the payroll as an employee, albeit one paid by the hour with no benefits.

If you want to run your consulting practice as a small business and therefore need to maintain independent contractor status—an option still feasible in spite of Section 1706 of the Tax Reform Law of 1986—it is vital that you work with a broker who will treat you as an independent contractor. It may take some work to find one, but once you accept a salaried consultant position it may be much harder

to convince the Internal Revenue Service in the future that you can meet the tests required to defend an independent contractor status.

- **Check out the broker.** You should expect a broker to thoroughly check your references

IF YOUR SKILLS are not strong enough to place you in a position to negotiate this base contract aggressively, you should probably not consider consulting at this phase in your career.

before placing you. It is equally important that you check out the broker. Talk to consultants who have worked with the broker and try to speak with managers who have hired consultants from the firm to get a feel for their quality.

Avoid companies that have a reputation for consistently winning contracts by submitting the lowest bid—these firms may pay the lowest rates or supply consultants who lack the skills that salespeople claim. Don't neglect to ask programmer friends about the skills of consultants they have worked with.

Once you have passed the preliminary screening, insist that the broker let you see the resume he plans to use in mar-

keting you. The first tip-off that a broker has no idea where or how to place you can be a garbled resume put together after your initial interview.

- **Recognize symptoms of trouble ahead.** Refuse to work with a broker who submits your resume for a job without contacting you first. This kind of behavior could alienate other brokers whom you have authorized to submit your resume for the same job. It also could alienate manag-

ers, so before signing anything, remind yourself that the contract the broker hands you was drafted by his lawyers and was drafted to defend his interests—not yours.

Contract areas that are particularly likely to cause trouble are clauses that limit your consulting activities after the present contract terminates and clauses that bind you to extend the contract on the same terms as the original contract if the client requests it.

If your skills are not strong enough to place you in a position to negotiate this base contract aggressively, you should probably not consider consulting at this phase in your career.

One good source of up-to-date information about contract provisions and the contract consulting market is the Independent Computer Consultants Association (ICCA). Regional chapters of the ICCA hold monthly meetings. In addition, members answer questions about consulting 24 hours a day on the association's Compuserve Consult Forum, and the group maintains a toll-free phone number (1-800-GET-ICCA).

The ICCA is currently compiling a list of consulting firms throughout the country that will work with consultants who wish to maintain independent contractor status.

Reid is a consultant/programmer in Windsor, Conn., and author of The Programmer's Survival Guide: Career Strategies for Computer Professionals.

ers who are shown your resume as part of a "bit-and-switch" maneuver.

Refuse to work with a broker who quotes you one rate for a job in the initial advertisement or phone contact but then offers a lower rate for the same job at the interview. Similarly, beware of the broker who presents you with a contract to sign on which the rate appears with significant "expenses" deducted from it that were not mentioned from the start.

• **Scrutinize the contract itself.** The contract you sign with a consulting firm is a binding legal document. Ignoring its provisions can land you in court. You must be prepared to honor the

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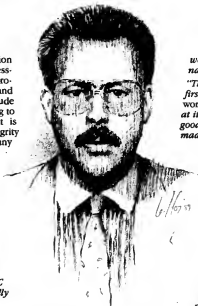
— David E. Yancy
Analysts International Corporation
St. Louis, Missouri

Analysts International Corporation (AIC) is a nationwide data processing consulting firm that provides programmers, analysts, project leaders and more to client companies that include many from the Fortune 100. According to Corporate Recruiter David Yancy, it is AIC's dedication to excellence, integrity and innovation that helped the company realize \$70 million in revenues in 1988 — and should propel it to over \$90 million in 1989.

Advertising plays a key role in corporate strategy. When it comes to attracting quality — and qualified — professionals, AIC advertises in *Computerworld's* Computer Careers pages.

"We want to attract quality people — professionals — and we want them from all across the United States. We're out to promote the AIC name, certainly, but what we're really after is immediate response."

"Computerworld is our top choice because, as far as I can see, everyone in MIS and DP reads it. In the past I have tried every major newspaper in the country and found nothing reaches our target audience like the Computer Careers pages in Computerworld. Plus,



we have the choice of regional or national buys.

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That's great — and it saves us several thousand dollars in agency fees.

"And it keeps on working. We received responses several weeks after our last ad ran. That's the kind of effectiveness we're looking for AIC will be advertising in Computerworld regularly throughout the year. It's proven effective, so there's no reason to change."

Computerworld. We're helping serious employers and qualified information systems, communications and

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R1

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The following information will help you determine the size ad you'd like to run and when you'd like to run it.

CLOSING DATES: To reserve space, you need to call us by 5PM (all continental U.S. time zones), 6 days prior to the Monday issue date. We need your ad materials (camera ready mechanical or copy for pub-set ad) by 5PM, 5 days prior to the weekly issue.

AD COPY: We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

LOGOS AND SPECIAL ARTWORK: Any logos or special artwork should be enclosed with your ad copy. For best reproduction, please send us either a stat of your logo or a clean sample on white bond paper.

COLUMN WIDTHS AND MINIMUM DEPTHS: Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half inch increments. The chart below can serve as a reference.

NUMBER OF COLUMNS	WIDTH	MINIMUM DEPTH
1 column	1 1/4"	2"
2 columns	2 5/8"	2"
3 columns	4 1/16"	3"
4 columns	5 9/16"	4"
5 columns	6 15/16"	5"
6 columns	8 3/8"	6"
7 columns	9 3/4"	7"

RATES: Your rate will depend on the size of your ad and whether you choose to run regional, or nationally. The national rate is \$13.50 per line or \$189.00 per column inch. The regional rate (Eastern, Midwestern or Western editions) is \$9.00 per line or \$126.00 per column inch. You can run your ad in any two regions for \$11.60 per

line or \$162.40 per column inch. In all cases, you can earn volume discounts.

The minimum ad size is two column inches (1 1/4" wide by 2" deep) and costs \$378.00 if run nationally. A sample of this size appears below. You can run larger ads in half-inch increments at \$94.50 per half inch. Box numbers are available and cost \$25 per insertion (\$50 if foreign).

Programmer Analyst

This is a sample ad for Computerworld's Computer Careers section. It will help you decide what size ad you'd like to run. Remember that you can run your ad either regionally or nationally in our recruitment section and that the minimum ad size is one column (1 1/4" wide) by two inches deep (2" high). This ad would cost \$378.00 if run nationally, \$252.00 in the Eastern, Midwestern, or Western edition, and \$226.80 in two regions, volume discounts apply.

SAMPLE AD SIZES AND PRICES: To assist you in planning your recruitment advertising, the following shows common ad sizes and their respective costs.

	Over Region (East, Midwest or West)	Two Regions (East/West Midwest/South)	National Edition
1 column x 2"	\$ 252.00	\$ 324.80	\$ 378.00
2 columns x 2"	\$ 504.00	\$ 649.60	\$ 756.00
3 columns x 2"	\$1,134.00	\$1,461.60	\$1,701.00
4 columns x 2"	\$2,520.00	\$3,168.00	\$3,780.00
5 columns x 2"	\$4,410.00	\$5,684.00	\$6,615.00

PAYMENT: If you're a first time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad) or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

COMPUTER CAREERS NETWORK BUYS: You can take advantage of special rates that let you run your ad in *Computerworld* and *Computerworld's* sister newspapers at special rates. Choose from *Computerworld Focus*, *Integration*, *Network World*, *InfoWorld*, *Digital News* and *Federal Computer Week*. Call for details.

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MARKETPLACE

Clearing desks for scanners

Falling prices, more software help fuel popularity of low-end machines

BY KEVIN BURDEN
OF STAFF

The growing popularity of desktop scanners suggests this emerging product might be losing its luxury status. With substantial price cuts and the introduction of improved software, more and smaller companies are expected to use the machines.

Desktop scanners are not brand-new; they have been around since the desktop publishing phenomenon took off in 1985. But early models were viewed as costly devices — so-called time savers that often cost more in time spent on corrections than they saved in data entry.

"Back then, scanners were rudimentary, and no one had any idea what to use them for," says Julie Desrosiers, associate director at market research firm BIS CAP International, Inc. in Santa Clara, Calif.

While high-end scanners will experience decreasing rates of market growth, unit shipments of desktop models will increase 33% per year in coming years, according to Venture Development Corp., a Natick, Mass.-based market research firm. Sales should rise from 36,000 units in 1988 to about 120,000

in 1992, according to the firm.

The growth of the desktop segment can be traced to several developments, the most important of which is falling prices. Few desktop publishers, by far the largest segment of desktop scanner users, can rationalize the \$40,000 required for a high-end scanner. Companies that can do so tend to be heavyweight publishers, data archiving firms and others with a pressing need.

Desktop scanners, on the other hand, are slipping into the affordable price range, in which a

broader spectrum of users find them worthwhile. Today the machines can cost anywhere from \$200 to \$10,000, depending on their power. Venture Development expects to see annual declines in price of 12%.

Prices have dropped as vendors such as Hewlett-Packard Co. and Truvel Corp. try to capture market share and establish themselves as industry leaders, according to Leone Johnson, project manager at Venture Development.

Vendors understand that

many potential customers are not sure what to look for in features and therefore buy according to price, leading the vendors to compete on price rather than features, according to Desrosiers.

"It took a while to feel out the market, but vendors are finally starting to realize at what price level they'll see acceptance for these devices," she says.

Improved software

Low prices cannot claim all the credit for the projected growth rate, however. The availability of improved scanning software is also playing a large role.

Both hardware and software for desktop scanning have become more versatile. Unlike high-end scanners, which are often feature-laden and geared for a specific application, a single desktop model can be used for graphics, OCR, facsimiles or teleconferencing.

"This is how we now see end users justifying the cost," says Bart Mallo, a research analyst at BIS CAP International in Newtonville, Mass. "They might buy it for its OCR capabilities but are now able to justify the expense from the extra functions," Mallo says.

Furthermore, scanning software packages that reside on personal computers allow better control over resolution and the number of gray tones than the primitive line art scanning packages of five years ago did.

Despite price cuts and technological progress, many potential users continue to view scanners as luxury items rather than essential hardware. Such would-be buyers might not know what a scanner can do for them, and even people who do know still might not view a scanner as cost-effective, according to analysts.

Dealers, too, lack an understanding of the capabilities of scanners, Desrosiers says.

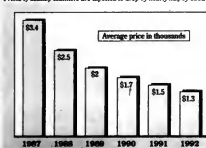
"Vendors are beginning to realize that the people who are doing the actual selling don't even understand image or text scanning. If they don't know how it works, how will they ever convey it to the user?" she asks.

As a result, analysts say, vendors are starting to realize that an educational effort lies ahead of them if scanners are to become general-purpose tools.

Burden is a researcher at Computerworld.

Plunging prices

Prices of desktop scanners are expected to drop by nearly half by 1992



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Closing prices report for the week ending May 19, 1989

	Closing price	Recent high	Recent low
IBM PC Model 076	\$650	\$800	\$450
XT Model 086	\$850	\$1,150	\$850
XT Model 089	\$1,175	\$1,400	\$950
AT Model 099	\$1,500	\$2,000	\$1,500
AT Model 239	\$1,800	\$2,100	\$1,775
AT Model 339	\$1,850	\$2,375	\$1,800
PS/2 Model 60	\$3,075	\$3,100	\$2,500
PS/2 Model 80	\$3,850	\$4,100	\$3,100
Compaq Portable I	\$700	\$750	\$550
Portable II	\$1,900	\$2,100	\$1,750
Portable III	\$2,700	\$2,950	\$2,200
Portable 286	\$1,700	\$1,975	\$1,675
Plus	\$900	\$1,200	\$900
Desktop 286	\$1,900	\$2,350	\$1,800
Desktop 386	\$2,625	\$2,900	\$2,500
Apple Macintosh 512	\$525	\$775	\$525
512E	\$700	\$975	\$600
Plus	\$1,000	\$1,100	\$950
II	\$3,800	\$4,175	\$3,425
Thomson T3390	\$2,800	\$3,000	\$2,725
Zenith 184 Superreport	\$1,700	\$1,775	\$1,300

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TRAINING

Teaching 4GLs to 3GL diehards

Instructors and students need to soothe generational conflicts

BY MARK DUNCAN
SPECIAL TO CW

The widespread use of fourth-generation languages (4GL) is requiring even the most resolute third-generation language (3GL) diehards to gain a degree of fluency in something other than Cobol.

Many 3GL programmers jump at the chance to learn a new language, no matter how different it is. But inevitably, a portion of people attending a 4GL class do so under protest. The success of the training will require compromise and understanding from both instructor and student. The organization faced with teaching a 3GL audience a 4GL may find the following suggestions helpful.

• **Unlearning.** Before the instructor launches into the wonders of the 4GL, he should spend some time adjusting the minds of the 3GL audience. He can do this by explaining broad differences between 3GLs and the new language and some of the 4GL's capabilities.

During the transition from

3GL to 4GL, the Cobol programmer will have to unlearn some aspects of Cobol programming before he can learn equivalent aspects of the 4GL.

• **An end-user language.** Although many 4GLs are accepted as legitimate application development tools, some programmers will regard them as end-user languages. They are likely to harbor a mild suspicion that they are being taught something inferior to 3GLs.

The instructor, while acknowledging the longevity of Cobol and its shibboleths, must show when it is sensible and practical to use 4GLs. He must convince students that 4GLs can fill gaps left by a 3GL's shortcomings in speed and unstructured development or system prototyping.

• **Internals.** Seasoned Cobol programmers possess a comprehensive and comfortable awareness of the language's capabilities — not simply what it can do, but how it does that.

The instructor must deliver similar information about the 4GL. It is easy to focus too heavily on the glamor and pizzazz of a

4GL — the condensed reporting language and instant screen generator. But this must be balanced with an explanation of what is going on behind the scenes. Contrary to popular belief, programmers are not content with simply using something — they want to know how it works.

For their part, students should approach 4GL training with an open mind. They will undoubtedly be surprised and frustrated at times in adapting to a new and different language.

Considering some of the points below may help manage those developments.

• **The Cobol hat.** When visiting a foreign country, it is instinctive to mentally convert your money to your home currency to make sense of it. But the longer you stay in the country, the less need there is for the conversion. The situation is similar with programmers learning a new language. The inclination is to continue how a problem is solved in Cobol, for instance, and then represent the logic in the 4GL.

For simple solutions, this may work, but the sooner you throw

away the 3GL hat and don the 4GL one, the better.

• **Database design.** In a typical information systems department, a database administration group will be the major player in database design. In 4GL development, however, this responsibility is generally assumed by the programmer or analyst. So database design concepts should be a prerequisite to or a part of the 4GL class.

• **Interactive development.** Despite the emergence of code generators and prototyping tools, the bulk of software is still developed in the code-compile-test style. Programmers will experience a departure from this approach with 4GL development. Most of them will relish the interpretive nature of 4GLs, which allow easy screen design, immediate testing of code changes and other benefits.

• **Self-documentation.** Unlike 3GLs, 4GLs are rarely self-documented. Therefore, programmers should devote extra attention to documenting production 4GL code. When 3GLs are applied with structured techniques, they can produce fairly readable programs, even without additional internal comments. This is generally not the case with 4GLs.

• **Poor diagnostics.** The diag-

nostic messages issued by a 4GL will generally disappoint a Cobol programmer accustomed to compiler diagnostics or abnormal program termination messages. Also, no language has reached the mature stability of Cobol, so new 4GL programmers may frequently seek technical support from the vendor.

• **Syntactic rigor.** Because of their high level, 4GLs generally are less syntactically demanding than 3GLs, and they provide a one-to-many relationship between statements and (internal) operations. For the same reason however, it is easy to develop 4GL programs that use the CPU inefficiently. Because most programmers have an innate desire to write efficient code, they will be eager to learn about 4GL internals to enable them to do so.

Above all, the instructor and the student must maintain realistic expectations of the training. Instructors should anticipate frequent challenges, realize that any kind of change is difficult and that the transition must be managed. Students should acknowledge that 4GLs are a legitimate force in applications development and that learning one will make them more marketable.

Duncan is a quality assurance consultant at a large Dallas firm.

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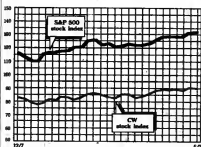
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Semiconductors	61.9	62.3
Peripherals & Subsystems	79.3	78.6
Leasing Companies	115.9	116.3
Composite Index	91.6	91.5
S&P 500 Index	132.9	134.2

Communications



Computer Systems



Software & DP Services



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Peripherals & Subsystems



Leasing Companies



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CLOSING PRICES WEDNESDAY, MAY 24, 1990

52-WEEK RANGE	PRICE		
	CLOSE MAY 24, 1989	WEEK NET CHANGE	WEEK PER CHANGE

Communications and Network Services

[illegible]

Computer Systems

[illegible]

Software & DP Services

[illegible]

Semiconductor

N	ADV MICRO DEVICES INC	27	7	8,189	-6.3	-2.7
M	ANALOG DEVICES INC	59	10	16,675	-0.2	-0.3
O	ANALOGIC CORP	10	0	10	0.0	0.0
N	CHIPS & TECHNOLOGIES INC	27	11	24.5	2.1	14.8
O	INTEL CORP	27	18	95.75	0.8	0.8
N	LSI LOGIC CORP	14	0	11.8	0.3	2.2
N	MONITOR TECHNOLOGY INC	88	19	24,625	0.5	0.5
N	MIROLOGA INC	58	-0	81.5	0.5	0.5
N	INTEL SEMICONDUCTOR	19	7	7.975	-0.4	-0.6
N	TECHNO METRICS INC	61	88	48.75	2.1	0.6
N	WESTERN DIGITAL CORP					

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Leasing Companies

	1988	1987	1986	1985	1984
AMPLICON INC	116	11	12.75	-1.8	-10.8
CAPITAL ASSOCIATES INTER-					
NATIONAL INC	8	9	7.825	0.0	0.0
CONSCICO INC	80	19	26.625	2.1	0.6
CONTINENTAL SPOHS		7	0	0.080	-0.1
LDI CORPORATION	17	10	18	0.3	1.7
PHONIX AMERICA INC	5	2	2.375	0.1	0.8
SELECTRON INC	6	9	2.125	0.8	0.8

EICHN—NEW YORK, A—AMERICAN Q—NATIONAL

Quick hitter

Compaq's desktop rollout spurs investor interest in its shares

In the battle to provide faster, more powerful machines, Compaq Computer Corp. beat IBM to the punch again, announcing its next generation of speedy desktop computers. Investors rewarded Compaq with steady support throughout the week: it closed Thursday at \$9, up 5 points. IBM's shares suffered only slightly, however, closing Thursday at 109 1/4, down 1 1/4 points. Digital Equipment Corp., after announcing a salary freeze in an effort to cut costs, saw its shares drop 4 1/4 points to a Thursday close of \$24.

Cray Research, Inc. rebounded from last week's reaction to founder Seymour Cray leaving to start up his own supercomputer firm; its shares moved up to close Thursday at 52, up 2 1/4 points. Quantum Corp., which sued Sony Corp. for an alleged infringement of its disk drive patent, climbed 1 1/4 points to finish at 15 1/4. Apple Computer, Inc. rose 2 1/4 points to close at 48 1/4.

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JOSEPH L. FATTON

Ethernet

FROM PAGE 1

leaving other vendors to provide the connections to popular networking environments such as Netbios and Transmission Control Protocol/Internet Protocol (TCP/IP).

Currently, only three Ethernet board vendors—3Com, Ungermann-Bass, Inc. and Western Digital Corp.—have been tested for OS/2 Extended support and have IBM's official recommendation. However, IBM expects to open the interface to other NDIS-compliant Ethernet board vendors with the next OS/2 Extended release, said IBM OS/2 Extended Open Systems Support Manager Eric Nelson.

By supporting Ethernet on OS/2 Extended, IBM stands to increase the market potential for the system by 200%, according

to Rick Villars, a senior analyst at International Data Group (IDC), a market research firm in Framingham, Mass. By 1992, Ethernet and Token-Ring combined will account for almost 70% of all personal computer local-area network installations, according to IDC.

"We're very excited about IBM's announcement," said David Langhoff, a telecommunications planning manager at Merivyn's. The San Francisco-based department store chain has both Token-Ring and Ethernet LANs installed and is "looking at the multiprocessing capabilities of OS/2 EE," Langhoff said.

What a relief it is

By providing its first comprehensive support of Ethernet, IBM has acknowledged that Ethernet and Token-Ring networks "each address a different set of user requirements" and has also taken a lot of the headaches out

of Langhoff's job as network in-charge, he added.

However, IBM will not be paying lip service to Ethernet connectivity if it does not find a way for Netbios and TCP/IP applications to access OS/2 Extended resources such as SQL databases, Langhoff said.

"It's our goal to have non-OS/2 workstations talk to OS/2 over Ethernet," Nelson said. IBM has no plans for delivering Ethernet for DOS systems, but other vendors can provide that support by supplying Ethernet software based on IBM's LAN Support Program.

The program, which is said to use the Netbios networking protocol to connect PC-DOS workstations to OS/2 Extended servers, currently works only over PC Network and Token-Ring, he added. IBM has announced no plans to migrate the program to Ethernet but "understands the requirement," Nelson said. IBM

has no announced plans to provide TCP/IP support for OS/2 Extended either, he added.

3Com plans to provide a way for its 3+ Open users to access OS/2 Extended servers by November, product manager Eric Siegel said. Also later this year, 3Com plans to release software that will allow its 3+ Open — and "theoretically, OS/2 EE" — users to support network applications based on the TCP/IP and Open Systems Interconnect protocol stacks.

An Ungermann-Bass spokesman said that the company also plans to provide a way for DOS workstations running its network system to access OS/2 Extended servers but would not say when it would be available.

IBM's announced support of NDIS defines Novell, Inc.'s position as a "different camp" from the IBM/Microsoft/3Com contingent, Siegel said. Novell recently released its own network

device driver interface, Open Data Link Interface, which directly competes with NDIS.

However, a Novell spokesman said that the use of different driver interfaces does not preclude interoperability between workstations using Novell's Netware and OS/2 Extended servers. The vendor is working on an OS/2 Extended edition of Netware and is beta-testing software that would allow Netware workstations to access an OS/2 Extended 1.1 server's resources, including SQL databases, he added.

3Com's demonstration of the new software showed an IBM Personal Computer AT running OS/2 Extended and the 3Com Etherlink II software interchanging data with an IBM Personal System/2 Model 60 running OS/2 Extended and 3Com's Etherlink/MS software for Micro Channel Architecture machines.

AT&T erects ISN-Datakit II bridge

BY ELISABETH HORWITT
CW STAFF

SAN FRANCISCO — Attempting to calm the abandonment fears of its Information Systems Network (ISN) users, AT&T has announced software that is said to couple the low-end Datakit II to its high-end sibling — and potential successor — the Datakit II Virtual Circuit Switch (VCS).

Addressing recent industry speculation that AT&T intends to phase out ISN, company District Manager Bob Donnelly maintained that the low-end switch fills a unique niche, both in terms of price and functionality (see box at right).

ISN is designed to link a limited number of terminals and hosts in campus environments, he said.

In contrast, Datakit II is a high-speed corporate backbone switch, featuring wider support of host protocols, bandwidth management, higher throughput and a "fan-out" feature that allows it to concentrate multiple incoming lines into one high-speed trunk.

The ISN and Datakit II VCS Internetworking package, introduced by AT&T last week, is said to allow customers to add Datakit II to an existing ISN network. This addresses users whose data traffic needs grow too great for the low-end switch to handle or who want to connect multiple ISN sites.

"Anyone with ISN, if they have many remote sites, will be interested in Datakit II" as a corporate backbone switch, said Steve Patrick, director of administrative systems at the University of Wisconsin, a major ISN customer.

The switch gap

AT&T envisions a smooth migration path from ISN to Datakit, but the capabilities are very different

Datakit II virtual circuit switch

- Maximum virtual circuits: 3,500
- Dynamic bandwidth allocation/Rerouting around faults: Yes
- Base price: \$75,000
- Target installation: Enterprise

Information Systems Network (ISN)

- Maximum virtual circuits: 1,900
- Dynamic bandwidth allocation/Rerouting around faults: No
- Base price: \$25,000
- Target installation: Building or campus

In addition to handling more circuits and bandwidth than ISN, Datakit II can provide more dynamic utilization of trunk bandwidth and can also reroute around faults without interrupting traffic instead of "rolling over and dropping everything on its back" whenever a fault happens, an ISN does, according to Patrick.

Too much, top to bottom

However, smaller users are still discouraged by the yawning functionality and cost gap between the top of the ISN line and the bottom of Datakit's range, according to Patrick. The Internetworking software "allows ISN users to have all of Datakit's features" — but only by buying the bigger switch, he added. "That's not a real palatable suggestion to an ISN user with under 2,000 endpoints."

A group of more than 50 ISN users in the academic sector, which met last week, expressed "disappointment that AT&T has added nothing to ISN." The group wants reassurance that the vendor "isn't forcing us to upgrade to a more expensive

product," Patrick said.

Patrick said that AT&T spokesmen have told the academic ISN user group that the firm "will not force us to migrate to Datakit" and that the vendor will shortly be announcing some enhancements to the product — hopefully in the network management area.

"You can use [AT&T network management system] Starkeeper for ISN, but that means buying a \$75,000 to \$85,000 system for a \$25,000 box," he said.

The university, along with many other users, would also like to see AT&T merge ISN into a unified Datakit II product line "that starts low and builds up in a gradual manner, without these big jumps," Patrick said.

"I can't in all honesty say that AT&T will never phase out ISN," Donnelly said, adding, however, that AT&T plans to continue marketing, manufacturing and supporting the product "as long as it makes business sense."

Priced at \$4,500, the Internetworking software is scheduled for availability in October.

Cornell suspends Morris over Internet episode

BY MICHAEL ALEXANDER
CW STAFF

Cornell University officials have suspended Robert T. Morris, the graduate student accused by the school of planting a worm that shut down thousands of computers on a nationwide network last year.

In a letter to Morris dated March 16, the board of Cornell University Graduate School said the school's Academic Integrity Hearing Board had determined that Morris had violated Cornell's code of academic integrity, according to an Associated Press report. A Cornell spokesman said that the university could not comment on the letter's contents or whether Morris had been suspended without violating federal privacy laws.

However, Thomas Guido-

boni, Morris' attorney, confirmed that Morris had received the letter and that "its contents had been accurately reported."

In April, a Cornell commission said that the worm had concocted the worm and sent it over Internet, a nationwide communications network linking computer systems at universities, research labs and defense agencies. The worm termed Morris' behavior "a juvenile act that ignored the clear potential consequences" and added that Morris was aware his actions were in violation of the university's policy for the use of the research-computing facility.

Morris has not been charged by federal authorities for his alleged role in creating the worm, but the U.S. Department of Justice has been considering the case since November 1988.

Hacker nabbed in Chicago

BY MICHAEL ALEXANDER
CW STAFF

U.S. Secret Service agents arrested a computer hacker in Chicago last week for operating a system that illegally accessed credit card and telephone calling numbers to obtain money through Western Union Corp.

According to an affidavit filed by the U.S. Department of Justice in the Northern District Court of Illinois, Leslie Lynn Doucette admitted that she had gotten the card numbers from hacker bulletin boards and corporate voice-mail computer systems. She is accused of using ille-

gally obtained access codes to try to check the validity of the card numbers.

The 35-year-old woman allegedly gave the credit card numbers to as many as 50 hackers, who then used the credit cards to purchase money orders from Western Union, payable to her. The Justice Department said that corporations and telephone service providers lost substantially more than \$200,000 to the conspirators. Special agents of the Secret Service executed search warrants in eight cities including Chicago, Boston, Los Angeles and Atlanta. Other arrests are expected.

TRENDS

IBM mainframes

IBM mainframes are staging a comeback.

According to estimates of U.S. installations compiled by Computer Intelligence in La Jolla, Calif., annual growth has resumed after leveling out to 1% in 1984 and staying there for four years.

For the past two years, growth has climbed back to about 10% annually. Computer Intelligence attributes the recent boost to the arrival of the IBM 9370 and the steady sales of the IBM 3090 series.

The 3090 line, introduced in 1985, added approximately 1,000 new systems every year. The strongest contributors in the group, the Model 300s and Model 600s, quadrupled in installations during the last year, Computer Intelligence said.

Meanwhile, the slow-selling 9370s have nevertheless made their mark. Since they became available in 1987, almost 5,000 have been put in place. The 9375 led the way, accounting for nearly 2,000 new systems in one year. The 9370 is technically considered a minicomputer rather than a mainframe.

Among new or on-order 3090s, nearly half are replacing other 3090 series machines as users upgrade, particularly to Model E. Only 4% of the new or planned 3090s will replace non-IBM mainframes from vendors such as Amdahl Corp. or National Advanced Systems. Seven percent will be first-time or additional systems; that is, they will be plugged in at new sites or will be new boxes at old sites adding mainframe power.

A well-traveled route to the 9370 is from a machine in the 4300 series. More than 50% of the new or ordered 9370s are slated to replace a 4300 model, according to Computer Intelligence. Nearly a third, however, are designated as new or additional systems.

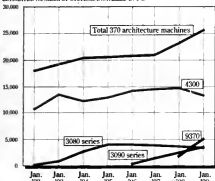
The research firm predicts this vitality trend will persist despite a downturn in 4300 and 3080 volumes. It anticipates continued growth for the 3090 series as the product approaches its peak.

Bob Djurdjevic, president of Annex Research in Phoenix, also foresees continued healthy growth for 3090s. He pointed out that hardware sales will be driven particularly by emerging application areas, such as image processing and numerically intensive applications that make use of capabilities of the 3090 with a vector processor.

LAURA O'CONNELL

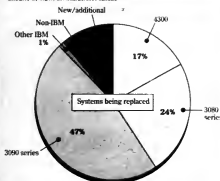
Newer lines boost population growth

ESTIMATED NUMBER OF SYSTEMS INSTALLED IN U.S.



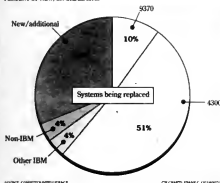
Most new 3090 users are old 3090 users

PERCENT OF NEW/ON-ORDER 3090 SERIES



Common path to the 9370 is from 4300s

PERCENT OF NEW/ON-ORDER 9370S



INSIDE LINES

Fishin' from the DB2 pond. DEC is expected to announce programming hooks next month between its VMS/RDB database and IBM's DB2 database management system. New RDB programming hooks will allow RDB to interoperate with DB2 without needing a file translation utility, according to industry sources. These hooks will allow RDB to recognize the DB2 file format immediately, which will allow VAX users to access and manipulate the DB2 files in their original form from the RDB database, sources said.

When dumb means nonprogrammable. IBM's recent Officevision announcement added two new catchphrases to a computing world desperately in need of more: the "non-programmable terminal" and the "programmable workstation." "Nonprogrammable terminal" solves the thorny problem of IBM referring to some of its products as dumb terminals. Word reportedly came down on high that no IBM products could possibly be dumb. "Programmable workstation" replaces what IBM had been calling intelligent workstations. IBM's lawyers reportedly found some stumbling block in the use of the word intelligent. The use of either word, "intelligent" or "programmable," opens the door for IBM to order dislodge PCs, which would be programmable, or intelligent, but would not qualify as computers, strictly speaking.

PC-in-the-box. By the end of next year, fast-food company Foodmaker plans to install Compaq 386 machines in all 700 of its company-owned Jack-in-the-Box restaurants. About 180 have been installed already, according to Terry Rabbitt, vice-president of HVS for the billion-dollar company, which also owns the Chi-Chi's Mexican restaurant chain. The PCs will be linked to point-of-sale systems in each restaurant for on-site applications processing and to hosts at Foodmaker's San Diego headquarters.

Life in the fast lane. Ungermann-Bass is expected this week to join the conga line behind IBM in announcing a 16M bit/sec. version of the 802.5 Token-Ring. IBM is already shipping a PC version and should be joined by other major local-area network makers in the Token-Ring fast lane as soon as user demand rears its head, an industry spokesman predicted.

Ambiguous-or and ambiguous-or. Speaking before the Massachusetts Computer Software Council last week, IBM manager of systems application architecture programs and support George Lipnik clarified, yet again, IBM's approach to Unix. The AIX world and the SAA world are "separate but equal," he told the gathering, adding, "AIX is a corollary but not a primary platform." In other words, some platforms are more equal than others.

Squash that bug. We reported some weeks ago [CW, May 1] that computer scientists at Nova University in Fort Lauderdale, Fla., had published a report concluding that a hardware-induced virus in the 8272A floppy disk controller made by Intel and NEC Electronics could cause a PC to lose data. Report author Adam Phillips said he recently got threatening telephone calls from an Intel attorney, a product manager and a public relations person at Intel, telling him to "basically... keep my mouth shut," Phillips said. Intel objected to Phillips calling the hardware bug a "virus," he added. Intel, meanwhile, has refused to say how many PCs use the controller chip, and NEC has not returned calls seeking more information about the problem.

No consensus on GUI. Graphical user interfaces have been a major topic of discussion at X/Open board meetings, and a recent meeting held in Tokyo was no exception. The group has been attempting to specify a high-level standard, and a previous combining vote had favored GSP's Motif. According to Steve Lorenz, the subject has not been resolved, but a work effort is under way to investigate how a standard might be reached that would not specify one particular product but would provide some common ground.

Got a tip? Spell the beans to Assistant News Editor James Connolly at 1-800-343-6474 or tap into the bulletin board at 508-638-0214, 0235 or -0165.

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